

U.S. INFORMATION SERVICES  
MARKET ANALYSIS PROGRAM

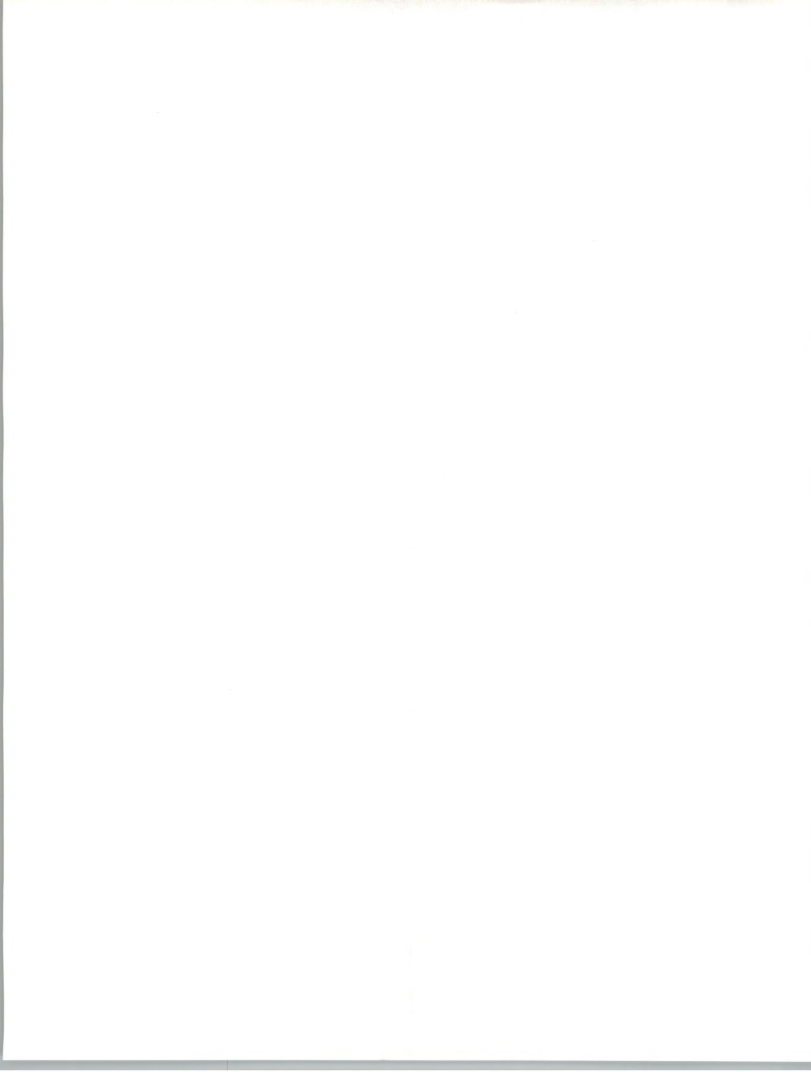
# **Human Resources**

Information Services  
Opportunities in  
Cross-Industry  
Markets

1992-1997

**INPUT<sup>®</sup>**

1280 Villa Street, Mountain View, CA 94041, (415) 961-3300



S E P T E M B E R     1 9 9 2

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# INFORMATION SERVICES OPPORTUNITIES IN CROSS-INDUSTRY MARKETS

1992-1997

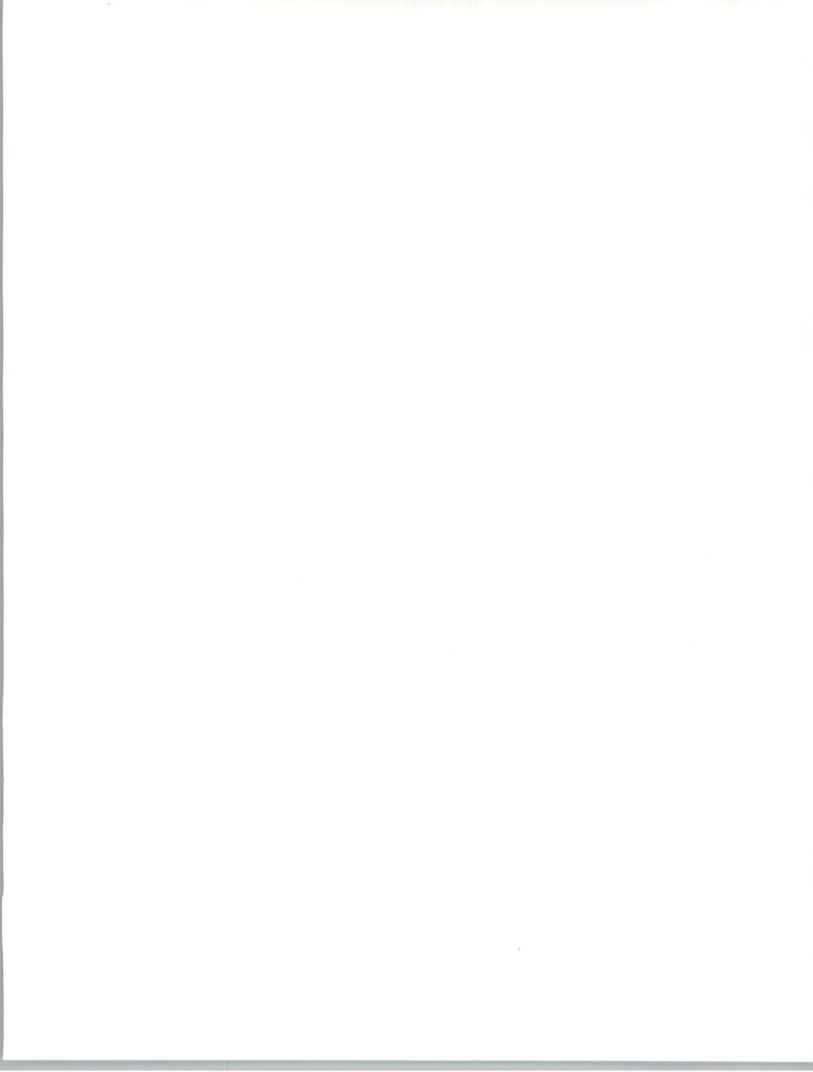
EXCERPT

Human Resources

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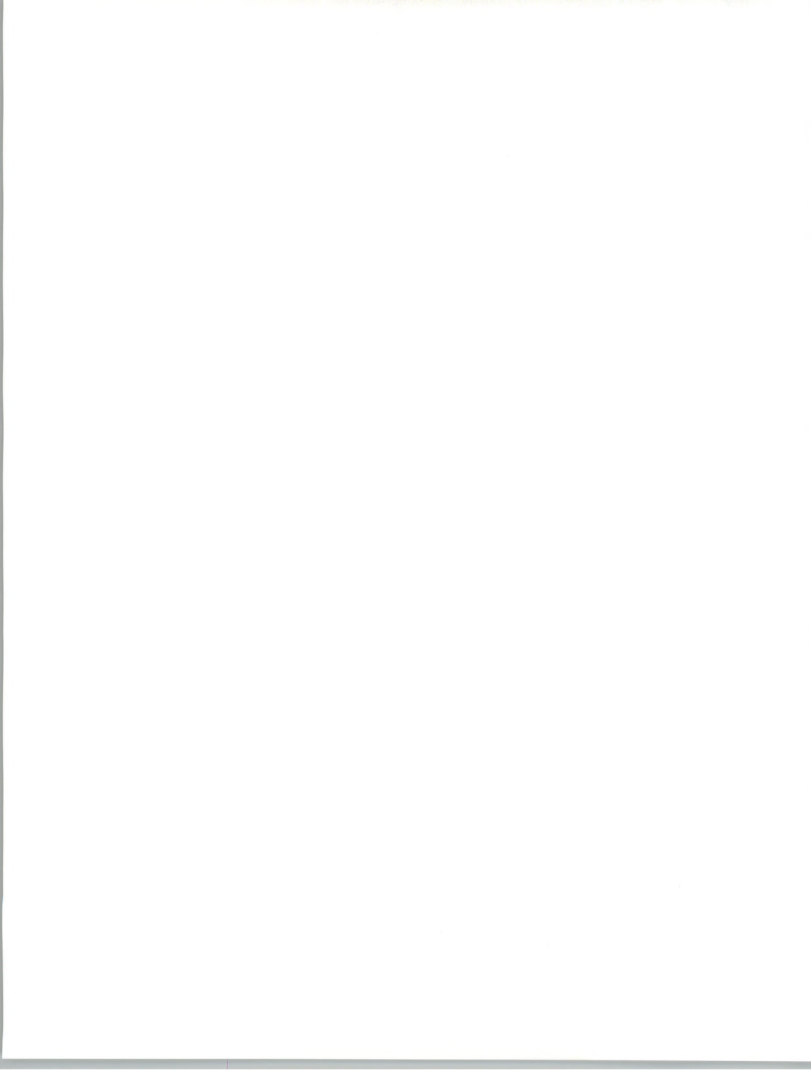
***Information Services Opportunities in  
Cross-Industry Markets, 1992-1997  
Human Resources***

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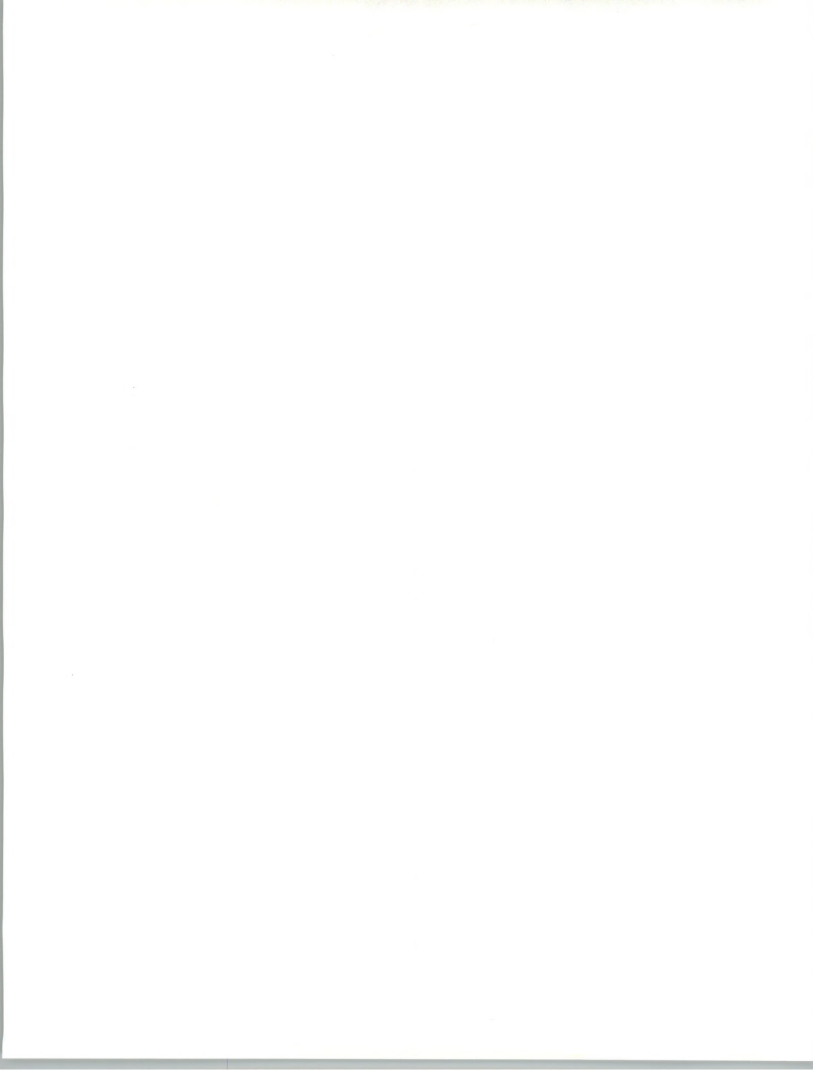


## Abstract

This document extracts Chapter IV, *Human Resources*, from INPUT's full report, *Information Services Opportunities in Cross-Industry Markets, 1992-1997*. The excerpt contains the *Introduction* (Chapter I) and *Human Resources* (Chapter IV) chapters from the full report, and also provides Appendix A, *Definition of Terms*, and the market-specific financials from Appendix B, *Forecast Data Base*.

The excerpt does not contain either the Executive Overview or Conclusions and Recommendations chapters from the full report, since these sections address all cross-industry market sectors at an overview level.

The extract is intended for readers who have an interest in a single cross-industry market sector. If data and analysis of other cross-industry market sectors is required, it can be obtained by purchasing the full report, *Information Services Opportunities in Cross-Industry Markets, 1992-1997*.





# Table of Contents

<b>I</b>	<b>Introduction</b>	<b>I-1</b>
	A. Purpose and Organization	I-1
	1. Purpose	I-1
	2. Organization	I-2
	B. Scope and Methodology	I-3
	1. Cross-Industry Sector Definitions	I-3
	2. Delivery Mode Definitions	I-3
	3. Methodology	I-4
	C. Forecast Assumptions	I-4
	1. Economic Overview	I-4
	2. Economic Impact	I-5
	D. Related Reports	I-6
	1. U.S. Markets	I-6
	2. European Markets	I-6
<b>IV</b>	<b>Human Resources</b>	<b>IV-1</b>
	A. Definitions	IV-1
	B. Information Services Markets	IV-1
	1. Applications Software Products	IV-5
	2. Turnkey Systems	IV-7
	3. Processing Services	IV-8
	C. User Department Directions	IV-10
	D. Trends/Technology Ratings of Importance	IV-12
	E. Vendors and Competitive Environment	IV-14
	1. Vendor Characteristics and Trends	IV-14
	2. Leading and Emerging Vendors	IV-16
	3. Vendor Profiles	IV-17
	a. Automatic Data Processing, Inc.	IV-17
	b. Control Data Corp., Business Management Services Division	IV-18
	c. Genesys Software Systems, Inc.	IV-19
	d. Integral Systems	IV-20
	e. PeopleSoft	IV-21



# Table of Contents (Continued)

## Appendixes

A. Definition of Terms	A-1
A. Introduction	A-1
B. Overall Definitions and Analytical Framework	A-2
1. Information Services	A-2
2. Market Forecasts/User Expenditures	A-3
3. Delivery Modes	A-4
4. Market Sectors	A-4
5. Trading Communities	A-4
6. Outsourcing	A-5
C. Delivery Modes and Submodes	A-6
1. Software Products	A-6
a. Systems Software Products	A-8
b. Applications Software Products	A-9
2. Turnkey Systems	A-11
3. Processing Services	A-12
4. Systems Operations	A-13
5. Systems Integration	A-14
6. Professional Services	A-16
7. Network Services	A-18
a. Electronic Information Services	A-18
b. Network Applications	A-19
8. Equipment Services	A-20
D. Computer Equipment	A-20
E. Sector Definitions	A-21
1. Industry Sector Definitions	A-21
2. Cross-Industry Sector Definitions	A-25
3. Delivery Mode Reporting by Sector	A-27
F. Vendor Revenue and User Expenditure Conversion	A-29
B. Forecast Data Base	B-1



# Exhibits

## IV

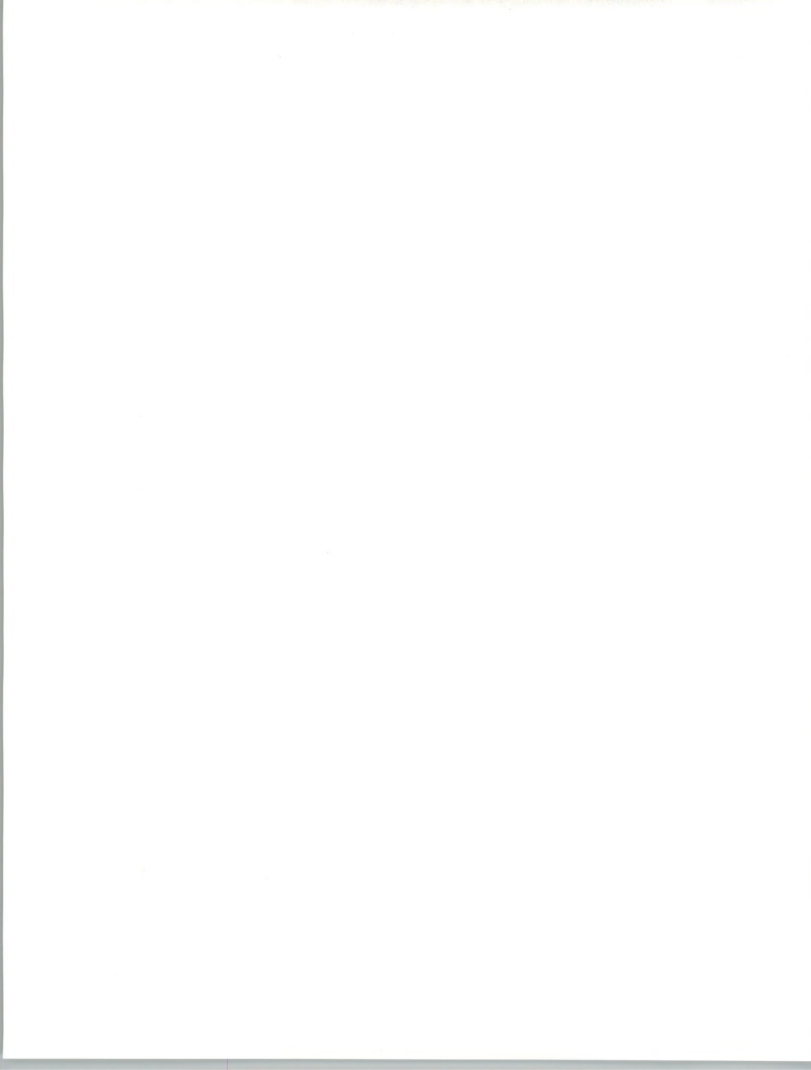
- |     |   |       |
|-----|---|-------|
| -1  | Human Resources Management Systems (HRMS) Applications  | IV-2  |
| -2  | Payroll Applications  | IV-3  |
| -3  | Human Resources Cross-Industry Sector—Information Services Market, 1992-1997                                    | IV-4  |
| -4  | Human Resources Cross-Industry Sector—Information Services Market by Delivery Mode, 1992-1997                   | IV-6  |
| -5  | Human Resources Cross-Industry Sector—Applications Software Products Market by Platform Size, 1992-1997         | IV-6  |
| -6  | Human Resources Cross-Industry Sector—Turnkey Systems Market, 1992-1997   | IV-8  |
| -7  | Human Resources Cross-Industry Sector—Processing Services Market, 1992-1997                                     | IV-9  |
| -8  | Human Resources Cross-Industry Sector—Respondents' Indication of Relative Importance of Trends and Technologies | IV-13 |
| -9  | Human Resources Cross-Industry Sector—Leading Applications Software Products Vendors                            | IV-16 |
| -10 | Human Resources Cross-Industry Sector—Leading Payroll Processing Services Vendors                               | IV-17 |

## A

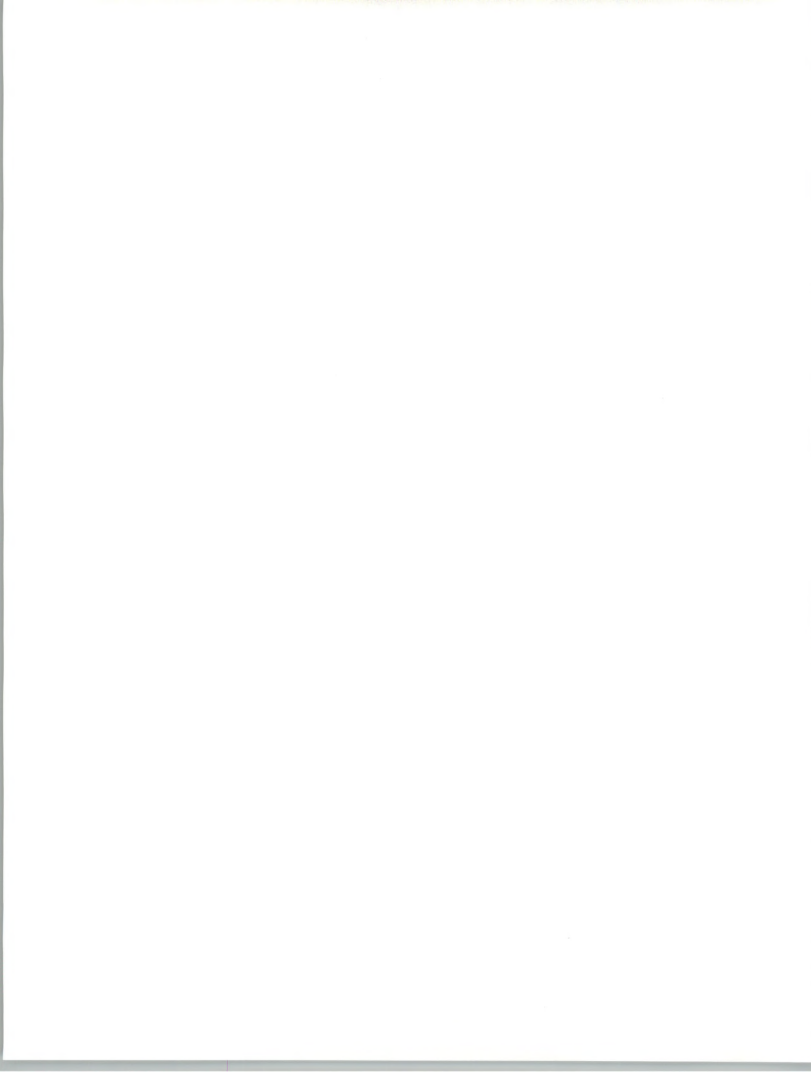
- |     |   |      |
|-----|---|------|
| -1  | Outsourcing Components—INPUT's View                 | A-5  |
| -2  | Information Services Industry Structure—1992        | A-7  |
| -3  | Systems Software Products—Market Structure          | A-8  |
| -4  | Application Products and Turnkey Systems            | A-10 |
| -5  | The Customization Spectrum                          | A-12 |
| -6  | Processing Services Market Structure                | A-12 |
| -7  | Products/Services in Systems Integration Projects   | A-15 |
| -8  | Professional Services Market Structure              | A-17 |
| -9  | Network Services Market Structure                   | A-18 |
| -10 | Industry Sector Definitions                         | A-22 |
| -11 | Delivery Mode versus Market Sector—Forecast Content | A-28 |
| -12 | Vendor Revenue to User Expenditure Conversion       | A-30 |

## B

- |    |   |     |
|----|---|-----|
| -1 | Human Resources Cross-Industry Sector—User Expenditure Forecast by Delivery Mode, 1991-1997 | B-1 |
| -2 | Human Resources Cross-Industry Sector—1992 MAP Data Base Reconciliation by Delivery Mode    | B-2 |











# Introduction

## A

### Purpose and Organization

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This report is part of a series of market analysis reports written each year by INPUT on industry and cross-industry sectors of the U.S. information services industry. This report analyzes the cross-industry sectors of the U.S. information services industry.

#### 1. Purpose

The objectives of this report are to:

- Forecast user expenditures during the next five years on information services for each of the seven cross-industry sectors
- Identify and discuss user department directions as they relate to each of the seven cross-industry sectors
- Identify technological issues and trends that are driving the use of information services for the cross-industry sectors
- Discuss the competitive environment and profile leading vendors in each of the cross-industry sectors
- Summarize findings through comparing and contrasting the cross-industry sectors

The report provides readers with insights and information that will help them:

- Review the forces shaping their markets
- Develop internal corporate financial projections

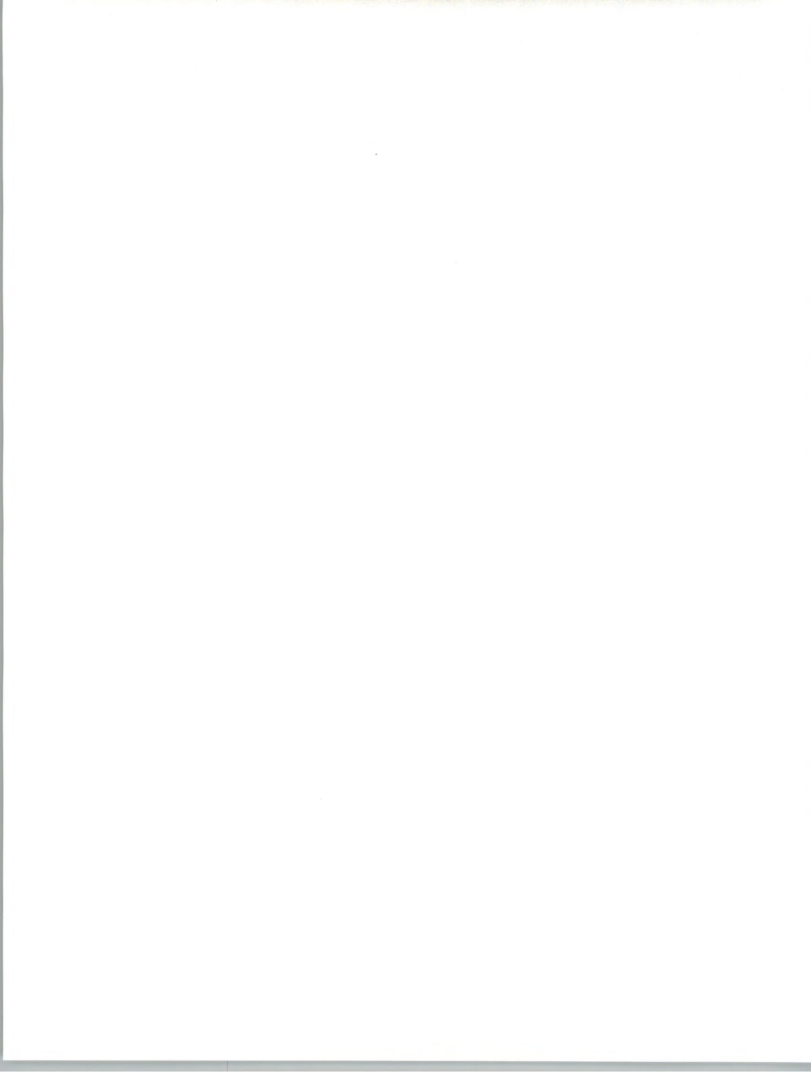


- Identify new markets and product and services opportunities
- Assess the competitive trends
- Determine potential market directions
- Assist in prioritizing investments

## 2. Organization

This report is organized as follows:

- Chapter II is an overview of the cross-industry sectors of the information services market.
- Chapters III through IX are individual discussions of each of the seven cross-industry sectors. Within each chapter there are five sections.
  - Section 1, *Definitions*, introduces and defines each of the cross-industry sectors.
  - Section 2, *Information Services Markets*, presents the information services market forecasts by delivery mode and submode for each of the seven cross-industry sectors.
  - Section 3, *User Department Directions*, discusses and analyzes interviews with end-user organizations representing the seven cross-industry sectors.
  - Section 4, *Trends/Technology Ratings of Importance*, provides vendor and user respondent ratings of the relative importance of eight technologies.
  - Section 5, *Vendors and Competitive Environment*, discusses the competitive environment for information services within each of the cross-industry sectors and profiles leading and emerging vendors.
- Chapter X summarizes the conclusions of Chapters III through IX.
- Appendix A—*Definition of Terms*—provides definitions and descriptions of market structures and terms used throughout INPUT's reports.



- Appendix B—*Forecast Data Base*—provides a detailed forecast by delivery mode for each cross-industry sector. It also contains a reconciliation to the previous year's cross-industry sector reports.

## **B**

### **Scope and Methodology**

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This report addresses the U.S. information services industry in seven cross-industry sectors. It includes only user expenditures that are noncaptive (generally available to vendors). Many large organizations have portions of their information services requirements satisfied by internal divisions. The resulting expenditure is not available for competitive bid by the general vendor community and is not included in INPUT's projections.

#### **1. Cross-Industry Sector Definitions**

INPUT defines cross-industry information services as packaged functional application solutions that are used by multiple industry sectors. In other words, these application solutions are not verticalized. For example, accounting, and planning and analysis are functions that are similar enough across all industries to be considered markets in their own right for nonverticalized application solutions.

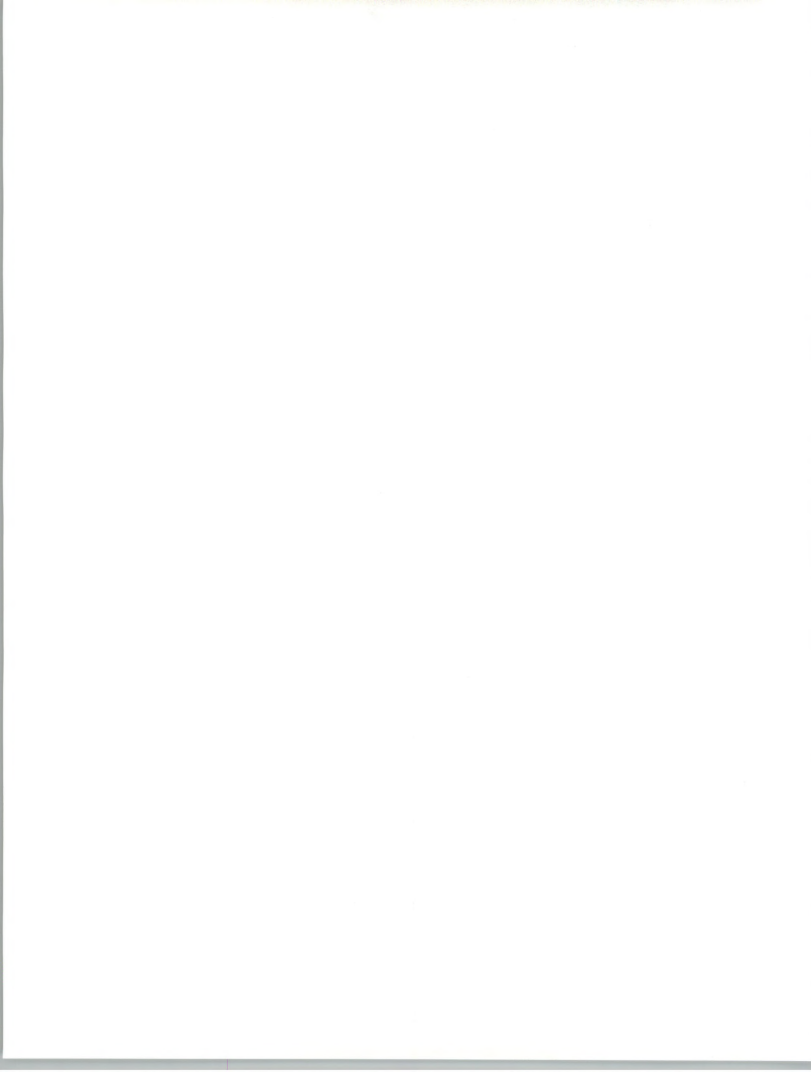
The seven cross-industry sectors identified by INPUT are:

- Accounting
- Human Resources
- Education and Training
- Engineering and Scientific
- Office Systems
- Planning and Analysis
- Sales and Marketing

#### **2. Delivery Mode Definitions**

Cross-industry information services are delivered via applications software products, turnkey systems and transaction processing services. Management support information services such as systems operations, systems integration and professional services, information delivery services and systems software are excluded from cross-industry consideration.

For a more complete discussion of INPUT's information services industry structure and market sector definitions, please refer to the separate volume, INPUT's *Definition of Terms* found in the volume I binder of the 1992 Market Analysis Program reports.



### 3. Methodology

Data was collected and analyzed from in-depth telephone interviews with 37 vendors and 18 user departments representing all cross-industry sectors. In addition, INPUT's library was used as an information resource, as were the results of previous INPUT reports on key aspects of the information services industry.

## C

### Forecast Assumptions

In developing the five-year forecasts, INPUT has incorporated current economic assumptions regarding the outlook for the U.S. economy as a whole.

- The GNP and GNP deflator growth rates used in INPUT's market projections are from the CONSENSUS forecast of the Blue Chip Economic Indicators of Sedona, Arizona. The Blue Chip CONSENSUS forecast is derived from a panel of economists representing leading financial, industrial, and research firms across the U.S. and has a 13-year track record of balanced and accurate projections.
- The economic situation is showing signs of improvement and its impact on the information services market will be more favorable in 1992 and beyond than it was in 1991.

#### 1. Economic Overview

The year 1991 was one in which the recession was expected to end, the recovery to start, and the ambiguities of an uncertain economy to gradually disappear. The end of the Middle East crisis brought a brief euphoria, as American troops, victorious in Iraq, returned home to hopes that the end of the conflict would "jump-start" the economy. Some encouraging signs were seen, but by year-end 1991, the U.S. economy was still sluggish, with no clear signs of a near-term sustainable recovery.

Phrases such as "all the necessary pieces to initiate and sustain a recovery are in place" have been common in the media, but as late as May 1992, the hoped-for sustainable upturn in the economy is just starting to be seen. Few disagree that a return to economic growth will happen, but opinions vary widely as to when a steady, sustainable turnaround will be solidly assured, how quickly the economy will rebound, and what the new growth rates will be for the country, the various industries and the financial resources that fuel the economy.





At present, economists are expecting an inflation-adjusted gross domestic product (GDP) to increase 2.8% from the fourth quarter of 1991 to the fourth quarter of 1992, and about the same increase in 1993. This will be the best economic performance in four years, but it is only half the average pace recorded in the initial years of previous recoveries.

## 2. Economic Impact

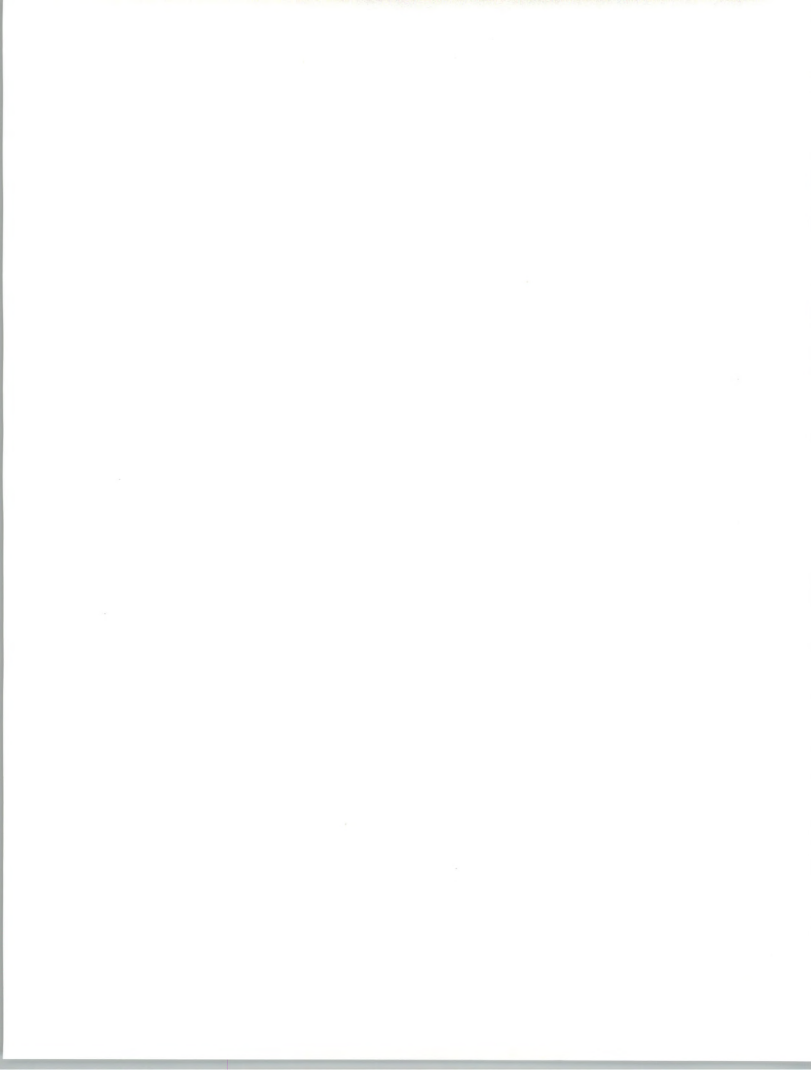
Official or unofficial, recession in the U.S. finally ended a decade of largely uninterrupted economic growth.

Economic growth is significant because the economy, as well as the overall size of the information services industry, is a significant factor in the user expenditure level for information services and software products. For example:

- The inflation rate of the past few years has been much more modest than in the mid-1980s and, as noted above, is expected to continue at modest levels. Because INPUT's forecasts and market sizes are in current dollars, lower inflation means lower growth.
- Real economic growth had been modest over the few years prior to the economic slowdown. As a result, deferred and canceled expansion plans in all industry sectors have slowed the expansion of information services expenditures. A 2.8% increase per year in the GDP for 1992 and 1993 is not likely to change this condition.
- The trend toward shifting information processing to smaller computers lowers the software products investment, based on current pricing practices. Thus, the quantities of software products sold increase, but revenue levels grow at a more modest rate.

The net economic influence on the cross-industry sectors for information services is that the slowdown in growth and constraints on budgets seen over the last two years will not appreciably change over the next two years.

Businesses that use cross-industry information services will still be dealing with their own market, product and organizational uncertainties, and although such an environment offers many opportunities for the use of new products and technologies, users are expected to continue their tendency toward cautious change and growth, and strong expense controls.



**D****Related Reports**

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Related reports of possible interest to the reader include:

**1. U.S. Markets**

- *U.S. Application Solutions Market, 1991-1996*
- *U.S. Processing Services Market, 1991-1996*
- *U.S. Industry Sector Markets, 1991-1996* (15 reports on all major industry sectors, e.g., insurance)

**2. European Markets**

- *The Western European Market Forecast for Computer Software and Services, 1991-1996*
- *Trends in Processing Services—Western Europe, 1991-1996*



## IV

## Human Resources

**A****Definitions**

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The human resources cross-industry sector consists of application solutions that are purchased by multiple industry sectors to serve the functions of human resources management and payroll. Examples of specific applications within these two major functions are provided in Exhibits IV-1 and IV-2.

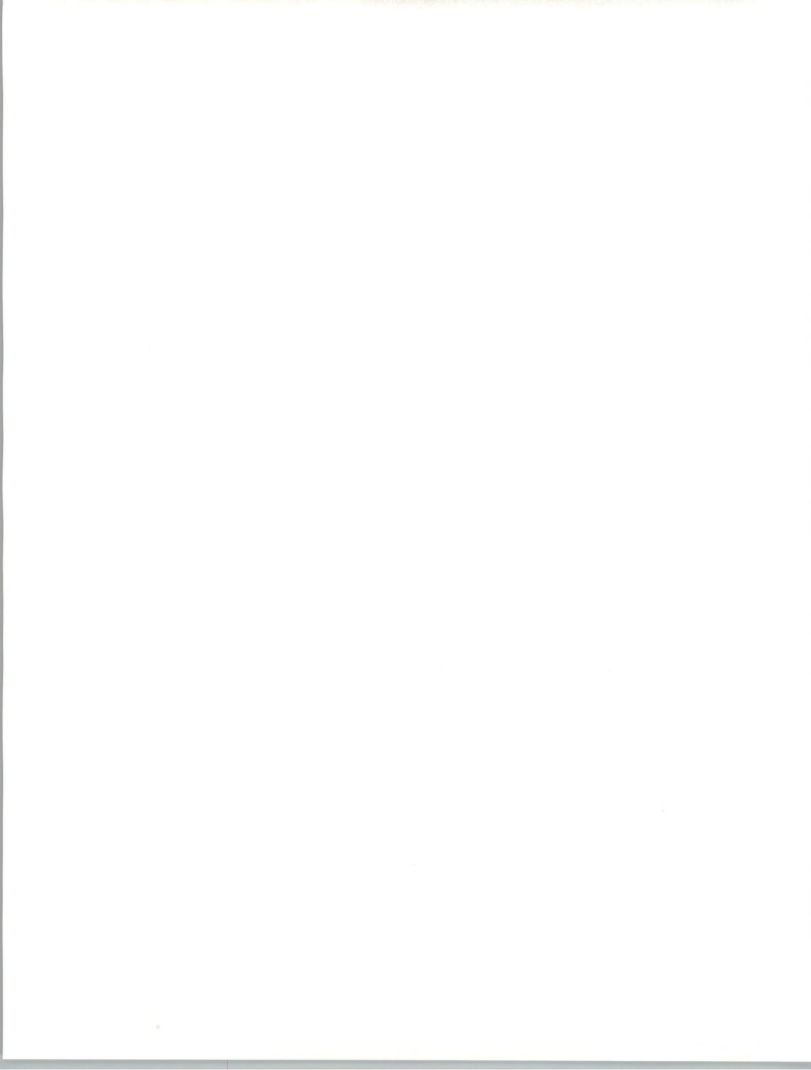
**B****Information Services Markets**

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Human resources is an obvious functional area for automation as it involves a tremendous amount of variable records and reporting requirements. Though on the whole a majority of systems are cross-industry, examples of vertical niches are government and health care, with further differentiation between union and non-union.

Purchase from a third party is strongly favored over internal development because of the continuous need for updates; the maintenance requirements are simply too great. Thus the growth of this cross-industry sector, unlike most of the other cross-industry sectors, is not strongly threatened by either the trend toward specialization or the desire for internal development.

Industry-specific human resources solutions do not appear to be as compelling a need as for industry-specific accounting solutions. However, as is true in some of the other cross-industry sectors, a movement is under way toward more tailoring of applications software products by both the software vendor and the customer.



## EXHIBIT IV-1

**Human Resources Management Systems  
(HRMS) Applications**

- Employee Relations
  - Time and attendance
  - Grievances
  - Seniority
  - Union/labor relations
  - Employee demographics, history
- Benefits Administration
  - Flexible benefits
  - 401(k)
  - Profit-sharing plans
  - IRA
  - Pension plans
- Government Compliance
  - EEOC
  - AAP
  - OSHA
  - COBRA
- Manpower Planning
  - Career planning
  - Turnover analysis
  - Human resource forecasting
- Compensation Administration
  - Wage and salary structure
  - Compensation budgeting
  - Salary performance review
- Applicant Tracking
  - Applicant demographics
  - Candidate search
  - Interview, selection
- Position Control
  - Inventory
  - Budgeting
  - Forecasting





## EXHIBIT IV-2

**Payroll Applications**

- Payroll processing
- Tax filing
- Unemployment tax management
- Unemployment compensation management
- Government regulatory compliance
- Payroll management
  - Payroll administration
  - Tax reporting
  - Flexible earnings
  - Payroll history

The ease with which a product can be tailored and the increased availability of tools with which to do this are compelling selling points. Vendors want to eliminate as much as possible the need for hard coded modifications and are offering easier-to-use report writers and front ends for such purposes. As an example, PeopleSoft's PeopleTools is a set of proprietary customization facilities.

More opportunity for customization is also provided by payroll processing services firms that are adding reporting capabilities. Processing services vendors are expected to be flexible in the presentation of an application solution and be willing to customize it to suit the client's needs.

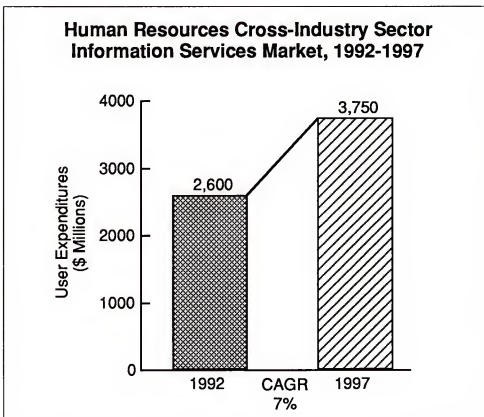
Exhibit IV-3 is INPUT's information services forecast for the human resources cross-industry sector.

The following are underlying driving forces mentioned in INPUT's report last year that will continue to drive the market during the 1992-1997 timeframe.

Increasing visibility of the human resources (HR) function—It is becoming increasingly apparent that attracting and retaining a highly skilled work force and containing "people costs" are of paramount importance to maintain a corporate competitive edge. The general perception is that effective human resources and payroll systems help to realize these objectives. Corporate executives are taking more notice of the HR function and the IS systems that support it. This driving force has a positive influence on user expenditures.



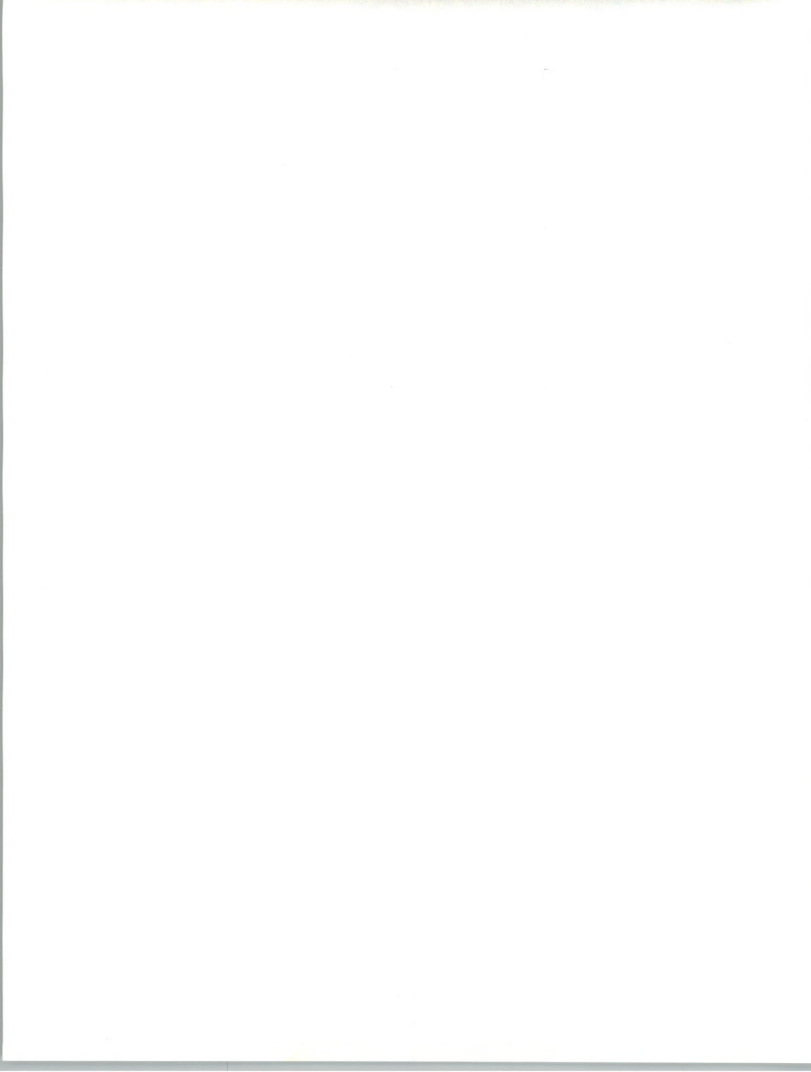
EXHIBIT IV-3



**Regulation**—The constant increase in government regulation and in the complexity of the human resources and payroll functions continues to be a major driver of both HR and payroll application solutions. An area of concern for human resources is keeping up with the tremendous amount of new legislation.

**Corporate restructuring**—Human resources departments must also handle all the changes effected by company consolidations, international expansion and downsizing. One phrase that aptly describes the human resources function is “keeping up with changes.” Constantly changing state and federal payroll regulations—FICA rates, minimum wage changes, FSLA requirements, 401(k) and IRA regulations, to name a few—require continuous updates in human resources management systems and payroll application solutions.

**Uncertain economy**—A slower economy will continue to have mixed influences on expenditures for this cross-industry sector in the short term. On one hand, a recession makes “people data” even more critical to track, review and analyze. On the other hand, a weak economy could signal potential expenditure cuts in all but production-level information services. It could also lead to decreasing need for payroll processing services as the size of the work force levels off.



Human resources and payroll self contained—Although the human resources and payroll functions are not entirely self contained, they are more independent than some of the other cross-industry sectors such as accounting, which cuts across multiple departments and levels. Because of this more contained nature, INPUT believes that new products and technologies will be more easily and quickly adopted by the human resources cross-industry sector. The user interviews discussed in Section 4 of this chapter bear this out.

New pricing schemes—Early indications are that a pricing strategy of choice will be based on the number of employees that will be processed through the system or on the number of payroll transactions. This way, a small organization would be paying less for a client/server solution than an organization with more employees.

INPUT therefore believes that new pricing schemes are less likely to have an adverse impact on human resources applications software products than in some of the other cross-industry sectors.

- Vendors will resist lowering prices; they will sell their client/server products on the basis of functionality/benefits—e.g., distributed data, multivendor, multiplatform—rather than with the lure of lower prices.
- In addition, human resources packages are less likely to be sold through mass merchandisers, at least for now.

A question that must be raised, however, is the extent to which new applications software solutions will erode expenditures on payroll processing services. This issue is addressed below, in subsection 3.

As shown in Exhibit IV-4, the largest human resources sector delivery mode will continue to be transaction processing services for payroll processing. The three delivery modes are discussed below.

### **1. Applications Software Products**

Exhibit IV-5 shows the growth expected in cross-industry human resources applications software products by platform size.



EXHIBIT IV-4

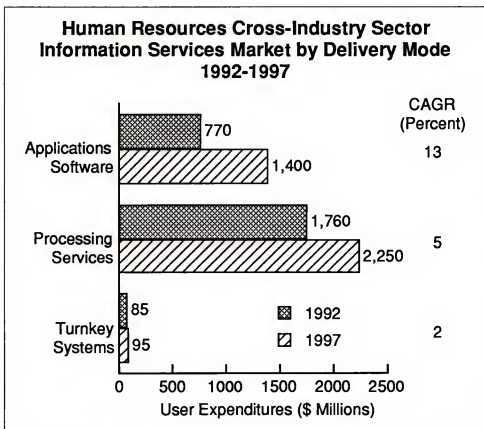
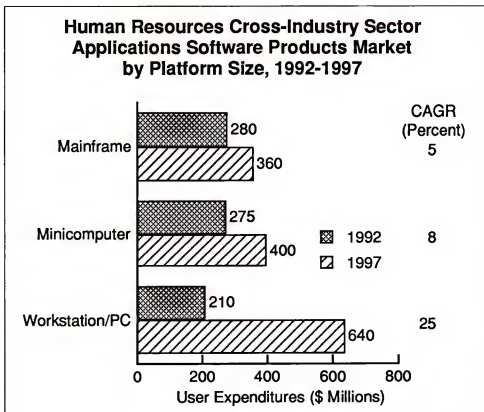


EXHIBIT IV-5







**Mainframe**—Most of the expenditures on mainframe-based solutions will be for maintenance/licensing fees of existing human resources applications software products as users opt for smaller platforms.

Vendors with mainframe solutions will attempt to diminish the impact of the downsizing trend by providing PC software that complements host-based systems. For example, downsized solutions for some aspects of human resources, but not necessarily a downsized solution for the entire area, is one way of going about this type of compromise. It is an interim step, however, for both vendors and customers.

**Minicomputer**—A general trend toward more modularity, e.g., a smaller system for benefits, a separate one for payroll, and a separate—yet integratable—system for resource planning, is also a growth promoter for both midrange and PC-based systems.

On the other hand, users will have to weigh the trade-offs between a minicomputer system and a PC LAN system or a client/server system. As a portion of would-be minicomputer users opt for PC LANs and client/server solutions, growth of user expenditures for minicomputer-based HR solutions will be negatively impacted.

**Workstation/PC**—The move to smaller platforms is well under way in the human resources sector. Client/server solutions perform well here because human resources and payroll are more independent functions than accounting, for example, which cuts across and must tie into many other functional areas within a corporation.

High growth will be especially apparent for workstation and PC solutions in the latter half of the forecast period as vendors introduce—and customers begin to accept—client/server solutions. All leading human resources software products vendors already have or are developing client/server versions of their products.

## 2. Turnkey Systems

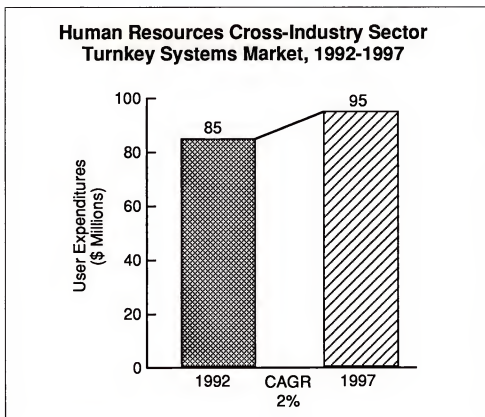
Turnkey systems expenditure in the human resources cross-industry sector is a small portion of overall user expenditures and will remain so. Human resources solutions are typically installed on existing hardware or hardware that has already been selected. If human resources and payroll functions are part of a turnkey system, it is usually a system that is industry-specific, such as for health care or for the legal profession.

A growth inhibitor is the increasing visibility given to integration and the productivity/cost improvements inherent in closer ties between human resources/payroll and financial/accounting functions. Turnkey systems that include other applications and are directed to vertical sectors will be the norm rather than turnkey systems dedicated to human resources.



User expenditures are small to begin, with and INPUT forecasts a slow growth rate for this delivery mode. Exhibit IV-6 shows the growth expected in cross-industry human resources turnkey systems.

EXHIBIT IV-6



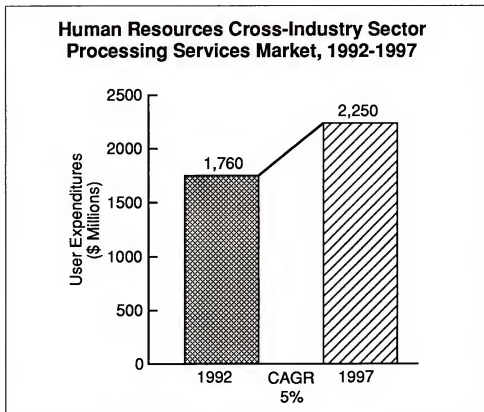
### 3. Processing Services

Payroll processing is the second largest processing services market, surpassed only by processing services sold to the banking and finance industry sector.

Exhibit IV-7 provides INPUT's 1992-1997 forecast for processing services within the human resources cross-industry sector.



EXHIBIT IV-7



The five-year compound annual growth rate (CAGR) is lower in this year's forecast (5%) than last year's (8%). Processing services vendors must address the following issues:

**Downsizing**—Offloading the central computer of applications software and/or data may be a growth promoter, as processing services is one of the alternatives to in-house mainframe computing. On the other hand, the alternative is to purchase solutions running on smaller platforms, especially in a client/server environment, as an in-house solution.

**Client/server computing**—The trend toward client/server computing suggests that the processing services vendor's centralized facility could act as the server while desktop computers at the customer site act as clients in a very interactive relationship. Processing services vendors will need to work aggressively to maintain strong relationships with their customers in this scenario, continuously updating their own software and also supplying, at the very least, client front-end software to their customers.

**Data availability**—A trend more pronounced this year than last year is customers' interest in more ad hoc data analysis capabilities. A key to continued growth in payroll processing services is vendors' ability to make customers' data available to them or even give it back to them once it's processed. Another success factor is flexible and customizable reporting capabilities.



Control Data Business Management Services Division's Orchestrator software is an example of how a payroll processing firm has responded to the need for data availability. Orchestrator enables users to enter payroll data via their microcomputers and transmit it to CDC-BMS for processing. It also enables customers to retrieve report and data files for ad hoc reporting or integration with Lotus 1-2-3, dBase and Wordstar.

Integration of payroll and human resources—A potential growth inhibitor for payroll processing services is the complexity of integrating payroll services with third-party HRMS, benefits and accounting software. To the extent that processing services vendors provide the HRMS and benefits software themselves and provide ways to integrate the two, growth for their services will be enhanced.

Penetration of smaller accounts—The majority of small companies (50 employees or less) still use a manual system. These small companies represent a sizable potential market for payroll processing services. But the question that remains is whether these companies will opt for PC-based solutions or client/server solutions—as prices for personal computers and workstations continue their decline, as software products pricing also continues to decline, and as systems become easier to use through graphical user interfaces and RDBMSs—or processing services.

In favor of the processing services option is the aforementioned complexity factor and the continual need for product upgrades reflecting changing regulatory requirements.

## C

### User Department Directions

The human resources respondents—ranging from a human resources IS consultant with a pharmaceuticals firm to a payroll processing manager at a cement company—have recently undergone or are undergoing major changes in their IS products and directions.

- The pharmaceuticals firm is replacing all three of its major human resources systems, including payroll, over a three-year period. It wants to standardize and consolidate much of the HR and payroll function to eliminate redundancies, improve data integrity, and be able to access data more easily. The systems in place now are eight to ten years old.
- A cement company downsized its payroll function from a mainframe to a minicomputer, and then recently decided to outsource the function to a processing services firm as it continued to decentralize its operations.





- A midsized telecommunications company will downsize within the next few years to networked PCs. It will seek not only new downsized HR solutions, but more flexible systems with closely integrated HR and payroll capabilities.
- A recently acquired retail food chain is developing a requirements list for completely new HR systems. Prior to the merger, this firm had customized its HR systems to such an extent over the years that they became too complex and unwieldy.

Human resources example—The pharmaceuticals firm provides an interesting example of the kinds of driving forces impacting human resources.

One of the external driving forces leading to these changes is that within the next several years the patent on one of its major products will expire. The company will therefore face new competition from firms with over-the-counter and generic drugs. The company will be forced to operate more efficiently and competitively.

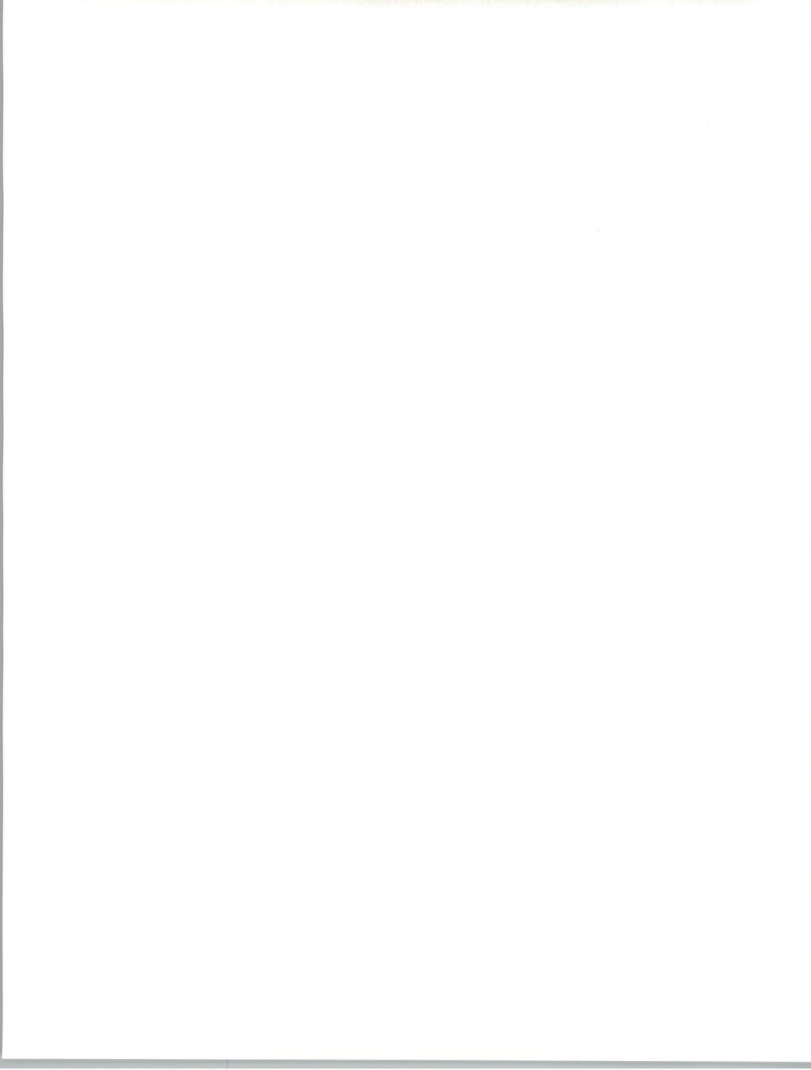
Another external driving force is that the government is placing more stringent rules on health care plans; it is likely that the firm's current large profit margins will be scrutinized. Again, the company will have to run leaner and meaner and is beginning to prepare for this eventuality. Therefore the human resources function is being pressured into being able to manage the company's internal resources—i.e., people—more efficiently.

The HR department is beginning to respond to these external forces in the following ways: it is adopting new and more equitable compensation plans, flexible benefits, and a new philosophy of performance including reducing the number of levels within a job category. It therefore needs new kinds of systems that support these new kinds of HR functions.

Payroll processing example—The cement company, which recently decided to outsource its payroll function, provides insight into the issues and needs of a large payroll department.

The company's decision to outsource was based on cost. The vendor selection process was difficult because payroll has become a shared function between the human resources and payroll departments. The vendor decision was "made by compromise."

The company needed to decide how much control of its own data it was willing to give up. Given that so much change is under way, both internally and externally, the company wanted to maintain easy access to its payroll data and decided it wanted to give up as little control as possible. It was therefore decided that the vendor would do the processing and then feed the data back to the client. The data would therefore essentially remain in-house.



Regardless of whether or not the function is human resources or payroll, interviewees consistently expressed the following needs:

- More flexibility in payroll processing services, human resources and payroll applications software products
- More easily customizable payroll and human resources applications software products
- More ease of access to information. HR and payroll data bases are becoming much larger.
- More integration of payroll with human resources software

Thus, in sharp contrast to the accounting cross-industry sector respondents, human resources and payroll respondents are undergoing radical changes that imply the advent of new information services and systems.

## D

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### Trends/Technology Ratings of Importance

Respondents within all cross-industry sectors—users and vendors—were asked to rate various trends and technologies on a scale of one to five, where one is unimportant or having little impact and five is very important or of significant impact.

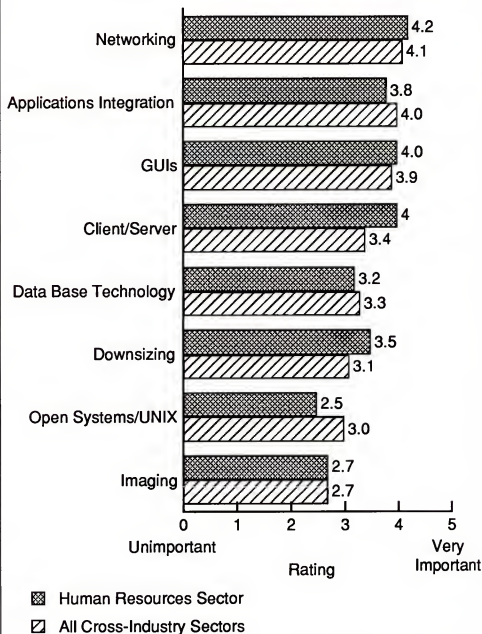
The technologies listed in Exhibit IV-8 were selected because INPUT believes they will receive the most attention from users and vendors over the next five years. In addition, INPUT believes their impacts on both users and vendors will be profound. Users who deploy these technologies will undergo re-engineering of their business functions. And vendors will need to change not only their products, but also the ways in which they price, sell and support them.

Exhibit IV-8 shows the composite rankings of the human resources cross-industry sector compared to the rankings of all cross-industry sectors combined.



EXHIBIT IV-8

### Human Resources Cross-Industry Sector Respondents' Indication of Relative Importance of Trends and Technologies



As is true with all cross-industry sectors combined, networking and applications integration are ranked high in terms of relative importance. However, the human resources sector is unique in that it ranks client/server architecture, GUIs and downsizing higher than all cross-industry sectors combined. These ratings are in sharp contrast to the accounting sector's relatively low ratings for these three trends.



INPUT believes these responses confirm that human resources and payroll lend themselves well to PC front ends and client/server products because these functions, although they may be integrated, are self contained. In fact, in large corporations such as the pharmaceuticals firm described above, these functions are under the direction of their own IS manager or staff member. They are more likely to have already undergone decentralization, from being mainframe based to being departmentally based.

These findings suggest that vendors selling to the human resources sector must have client/server products available now, or be well into the development process. If they don't, new vendors will take advantage of the opportunity that exists to enter this market.

Respondents for all cross-industry sectors were also asked to rank the technologies and trends in terms of importance in 1997. All technologies for all cross-industry sectors increase in importance over the five-year period.

Even given the above, human resources distinguishes itself in 1997 in that imaging technology, although ranked the same as in all cross-industry sectors combined in 1992, becomes significantly more important in 1997 (4.3 for human resources versus 3.7 for all cross-industry sectors combined).

As is true with all cross-industry sectors, within the human resources sector vendor rankings are generally slightly higher than user rankings. The largest discrepancies for 1992 are for client/server architecture and data base technologies, where vendor rankings are 2.3 and 2.0 times higher than user rankings.

## E

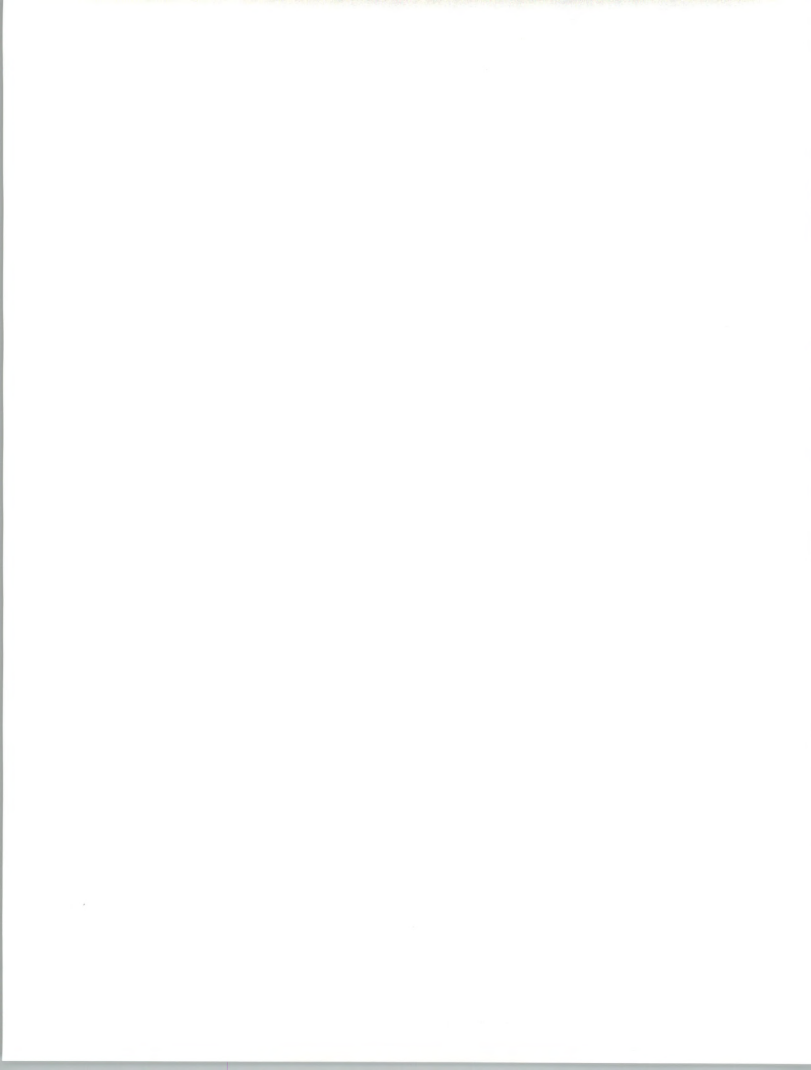
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### Vendors and Competitive Environment

#### 1. Vendor Characteristics and Trends

Vendors who participate in the human resources cross-industry sector are also likely to participate in the accounting sector. Therefore the vendor characteristics and trends are essentially the same except that human resources solutions do not warrant new DB2 implementations, and multinational human resources capabilities are not being pursued.

Downsizing—The use of microcomputers as access points to the data base for uploading or downloading is still being exploited as a product/service extension.





Personal computers have changed the way payroll processing services are delivered to customers. A trend continues for payroll processing firms to accept and transmit data where the client wants it in order to remain a viable alternative to in-house solutions.

**Client/server**—Various versions of client/server software products are beginning to emerge. Notable examples are PeopleSoft's product line and the products that are under development by Dun & Bradstreet Software and Genesys.

Although almost all major applications software vendors are developing client/server HRMS products, client/server payroll packages are for the most part not on the drawing board due to the bottleneck created in transferring large quantities of data back and forth, and the heavy printing requirements.

**Integrated products and services**—Vendors are placing increasing emphasis on integrated functions in the following ways:

- Integration of HR modules with one another
- Closer integration of HR and payroll
- Integration of HR and payroll with financial applications

Increasing emphasis on integration creates challenges for vendors whose product lines consist of multiple applications that have been acquired (rather than "home grown") along the way; for vendors that specialize in HR applications software products to the exclusion of payroll applications; and especially for vendors that specialize in HR. Integration also creates challenges for payroll processing firms that do only payroll.

We can therefore expect more collaboration between, and with, specialist vendors and with systems integrators.

**Additional Services**—The trend toward outsourcing is creating new demand for additional services. Customers are beginning to want to pay vendors to maintain their software rather than hire their own people to do it. There appears to be a trend toward applications software management by the vendor on an ongoing basis.

Revenues from consulting services for Cyborg Systems and Dun & Bradstreet Software now account for 20%-30% of their total U.S. revenues. These services are expanding to include project management, tailoring of applications software products, and on-site education.

As payroll processing services vendors begin to feel pressure from in-house solutions, they will seek additional sources of revenue, such as from applications software products.



## 2. Leading and Emerging Vendors

Exhibit IV-9 lists leading software vendors in this cross-industry sector. Their current predominant platform types are indicated. Essentially all of them are downsizing.

The market is crowded; at least 100 companies offer human resources and payroll software packages. The smaller companies compete on the basis of price and additional features rather than offering leading-edge technology.

EXHIBIT IV-9

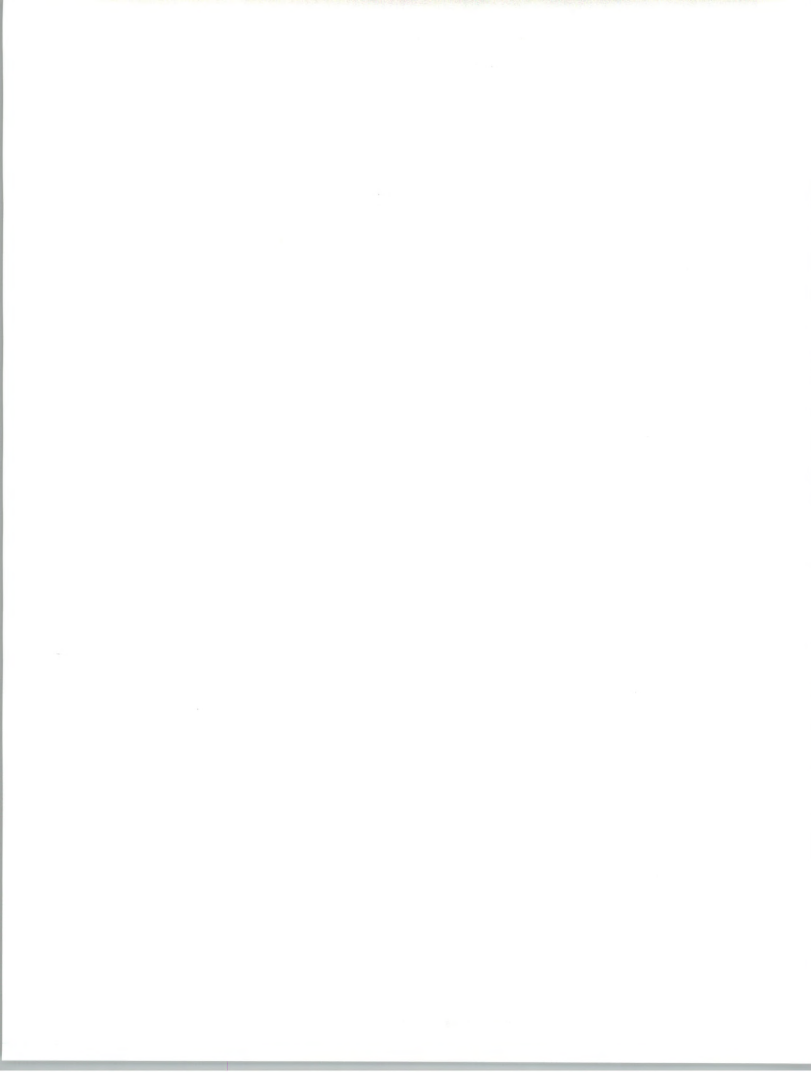
### Human Resources Cross-Industry Sector Leading Applications Software Products Vendors

Vendor	Current Platform
Cyborg	Mainframe
D&B Software	Mainframe
Genesys	Mainframe
Information Science	Mainframe
Integral Systems	Mainframe
PeopleSoft	Client/server
Software Plus	Midrange
Software 2000	Midrange
Spectrum Human Resources	Microcomputer
Tesseract	Mainframe

Exhibit IV-10 lists leading processing services vendors in this cross-industry sector.

There are only three nationwide payroll processing services vendors: Automatic Data Processing (ADP), Control Data Business Management Systems, and Paychex. ADP is the clear leader, with approximately \$950 million in processing services revenues. Paychex's and CDC's estimated processing services revenues are each in the \$100 million to \$130 million range.

ADP recently acquired fourth-place Bank of America Business Services Division.



## EXHIBIT IV-10

**Human Resources Cross-Industry Sector  
Leading Payroll Processing  
Services Vendors**

- ADP
- Paychex
- Control Data Corporation

Paychex's focus is to provide basic payroll processing services to small companies (200 or fewer employees); CDC offers a customizable payroll processing service to businesses with 100 or more employees. ADP services the needs of all sizes of companies. Large regional payroll processing services vendors include Automated Payroll Services (Boston) and CRI Computing (Reno). Additional local vendors number around 1,000 and include banks, accounting firms, and other small independent firms. INPUT expects continued consolidation.

**3. Vendor Profiles**

The companies INPUT has selected to profile exemplify technological trends and a variety of competitive approaches to the human resources cross-industry sector marketplace.

**a. Automatic Data Processing, Inc.**

Automatic Data Processing (ADP) was formed in 1949 as Automatic Payrolls, Inc. ADP focuses on four businesses: Employer Services, Brokerage Services, Dealer Services and Automotive Claims.

As it pursued a strategy of broadening the scope of each of these four services, the company divested four other businesses in recent years: real estate processing services, automated teller machine processing services, banking information services, and a quotation services business in Canada.

Within Employer Services, ADP provides an integrated package of services, including payroll processing and financial services, human resources, and benefits services. Payroll services are its largest single form of service and include automatic deposit, quarterly and annual social security and income tax withholding reports, W-2 withholding statements for employees, a complete record of payments for each pay period, and periodic employee historic earnings records. Also included are special statistical and audit reports for management, such as payroll and job cost distribution reports, welfare and pension fund reports, and payroll audit reports.



ADP's Employer Services customer base numbers 3,000 large companies, 120,000 midsized (25-500 employees) accounts, and 125,000 small businesses. Employer Services are provided from over 40 regional processing centers in the U.S. and from centers in London, Rotterdam, Campinas, São Paulo, Rio de Janeiro, Toronto, and Montreal.

ADP's fiscal 1991 revenues were \$1.8 billion, all of which is U.S. based. INPUT estimates that ADP's revenues are derived approximately as follows:

Employer Services	59%
Brokerage Services	20%
Dealer Services	10%
Automotive Claims	6%
Other	5%

Revenue growth for fiscal 1991 was strongest in Employer Services, which grew at a double-digit rate.

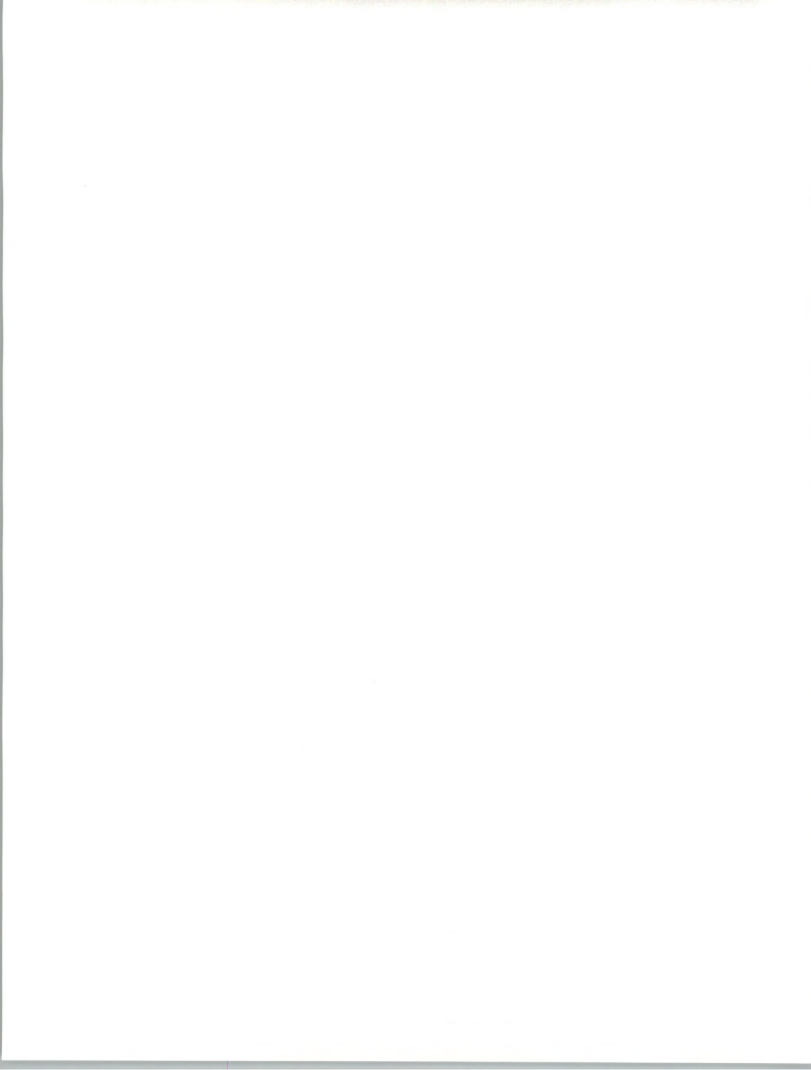
Since the early 1960s, ADP has implemented an active acquisition program, to diversify from its primary business of providing payroll services. Significant gains have been made in brokerage services to automotive dealers and automotive claims services for automobile insurers and repairers.

#### **b. Control Data Corp., Business Management Services Division**

CDC-BMS is the oldest American business and data processing services firm, having begun in 1932 as the Service Bureau Company. CDC-BMS provides processing services and software products for payroll, tax filing, human resources management and accounting applications.

Payroll and human resources products and services are all integrated and consist of:

- Signature Payroll and Tax Filing Services files payroll taxes, monitors labor and job costs, and tracks attendance and absenteeism. The service also provides detailed payroll analysis reports.
- Repertoire Human Resources Management System, available since 1985, allows companies to merge their payroll and personnel records into a single data base of employee information for on-line inquiry, updating and reporting.
- Orchestrator software enables users to enter payroll data via their micro-computers and transmit it to CDC-BMS for processing. It also enables customers to retrieve report and data files for ad hoc reporting or integration with Lotus 1-2-3, dBase and Wordstar.





- Repertoire/Applicant Track is a module that allows companies to access previous candidates' skills, education and experience—then generate a "snapshot" of their qualifications that can be routed to hiring managers for review. The module also helps companies determine the cost of each individual hired, so they can channel time and financial resources to employment or search firms with the most proven value. It also helps companies track and analyze EEO data. As of May 1991, Applicant Track was in beta test.

INPUT estimates that CDC-BMS's 1991 revenues were \$195 million. Approximately 5% of CDC-BMS' revenue is from accounting processing services. BMS also provides benefits claims services and the Employee Advisory Resource (EAR), a telephone-based employee assistance program for personal problem resolution.

#### c. Genesys Software Systems, Inc.

Genesys Software Systems, founded in 1981, provides payroll, human resources, defined benefits, defined contribution, human resource planning, and flexible benefits applications software products. Genesys software products, until the last several years, all ran on IBM mainframes.

Genesys is an example of a company whose applications software products are rich in functionality. Its Human Resource Systems has applicant tracking, staffing, wage and salary analysis, training and development, turnover analysis, benefits administration, government compliance and union regulations.

Products now include:

- DB2 versions of all of its products
- Standalone PC and PC LAN versions of its products
- Client/server versions of all of its products, where the server is a 486-based PC
- An imaging product to be used with payroll and human resources client/server products. This product is not yet available for general distribution.

In addition to applications software products, Genesys has gotten involved in two other delivery modes over the last several years:

- The Processing Services Division, formed in 1988, provides benefits and payroll processing services. Genesys is now competing head to head with ADP in the category of companies with more than 400 employees.



- The Data Center Division, also formed in 1988, provides systems operations for customers' Genesys Human Resource software licenses at the Genesys Data Center, either temporarily or on a long-term basis.

Estimated revenues for fiscal 1991 (6/91) are \$15 million.

#### **d. Integral Systems**

Integral Systems' strategy is to:

- Continue its SAA direction, offering a complete portfolio of financial and human resource management software across all of IBM's SAA-compliant platforms
- Continue to modernize and broaden its AS/400 product line
- Continue to broaden its PC-based product line

Mainframe products include:

Personnel Administration  
Payroll Processing  
Applicant Management  
Position Control  
Benefits Administration  
Pension Administration  
Flexible Compensation

Integral expects its AS/400 software products to increase from their current contribution of 20% of revenues, while mainframe-based software products become a smaller portion of the whole. The company's revenue from services is also expected to take up the slack in mainframe software product sales.

Most of Integral's PC-based applications address specialized needs but tie into a shared mainframe data base. Examples are CAAPS for Affirmative Action management, JobTrak for succession planning, OrgChart for organizational planning and analysis, and Workbench for salary planning and administration.

Integral also offers HRI, a PC workstation-based solution that can interact with a mainframe, for organizations that want to delegate HR record keeping and reporting responsibility to individual divisions or departments but still support the central data base.

Integral's HR Minder enables managers to monitor the HR data base for events—such as upcoming performance reviews—and receive immediate notification for tracked events.



INPUT believes that Integral is still too reliant on revenues from mainframe-based products and that it will have to deliver on a client/server product in the near future in order to remain a serious contender in this market.

#### **e. PeopleSoft**

PeopleSoft was founded by the co-founder and former chairman of Integral.

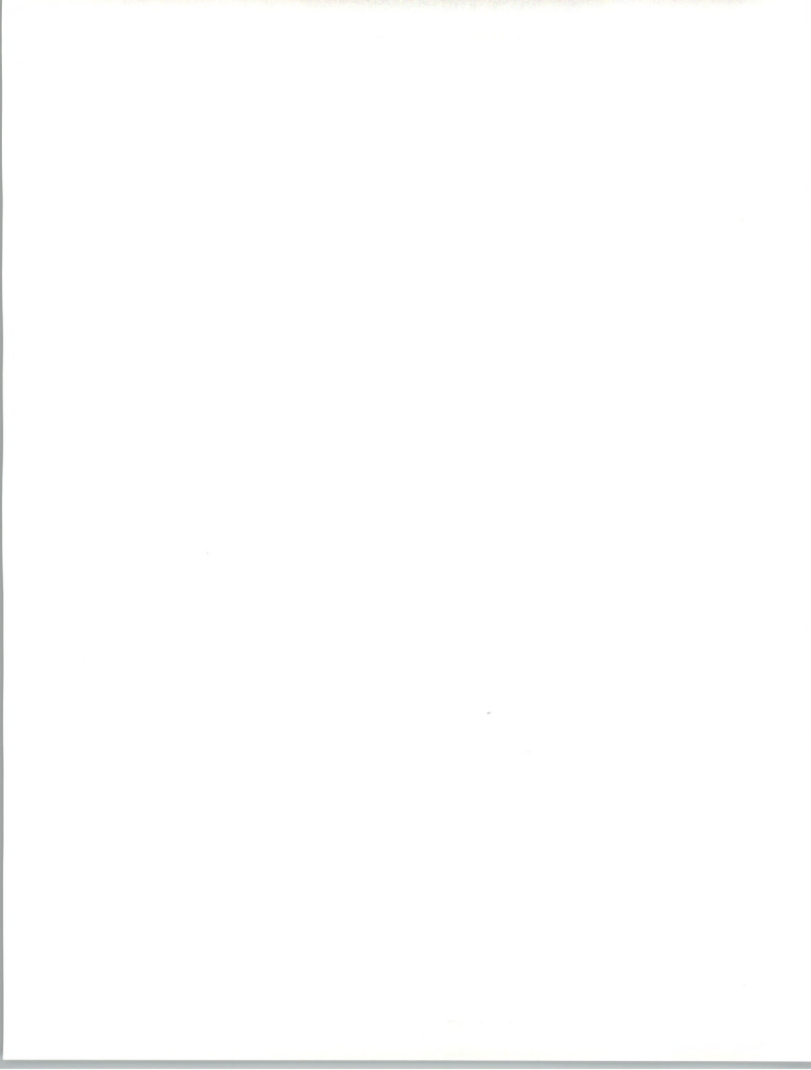
PeopleSoft HRMS includes payroll, personnel and benefits. It has a Microsoft Windows 3.0 graphical user interface and supports SQL data base systems such as SQL Server, Gupta, Oracle and DB2. The product also complies with SAA. Support is planned for OS/1 and Presentation Manager.

PSHRMS also has several report writing options, PeopleTools, an application development tool set, and a set of proprietary customization facilities. PSHRMS also has a kiosk module for employee access to benefits and selected personal data. PSHRMS is exemplary of the new generation of human resources products that are beginning to appear on the market. It was built from the ground up.

PSHRMS operates on a variety of computers (LANs, midranges, and IBM mainframes) and data bases (DB2, RdB, AllBase, SQLBase, SQL Server, and Oracle).

PeopleSoft has had the client/server arena to itself for over two years; this year, however, client/server versions are being introduced by many major competitors. It is not clear that this two-year lead is a major advantage in the long term, as INPUT research shows that the majority of potential buyers are just beginning to embrace client/server technology. PeopleSoft is selling its client/server products to "early adopters." And a large portion of its 1991 revenues came from mainframe-based products.

PeopleSoft has the advantage of not having to please an existing customer base. Revenues in calendar 1991 were \$20 million. PeopleSoft projects 1992 revenues of \$32 million.











## Definition of Terms

### A

#### Introduction

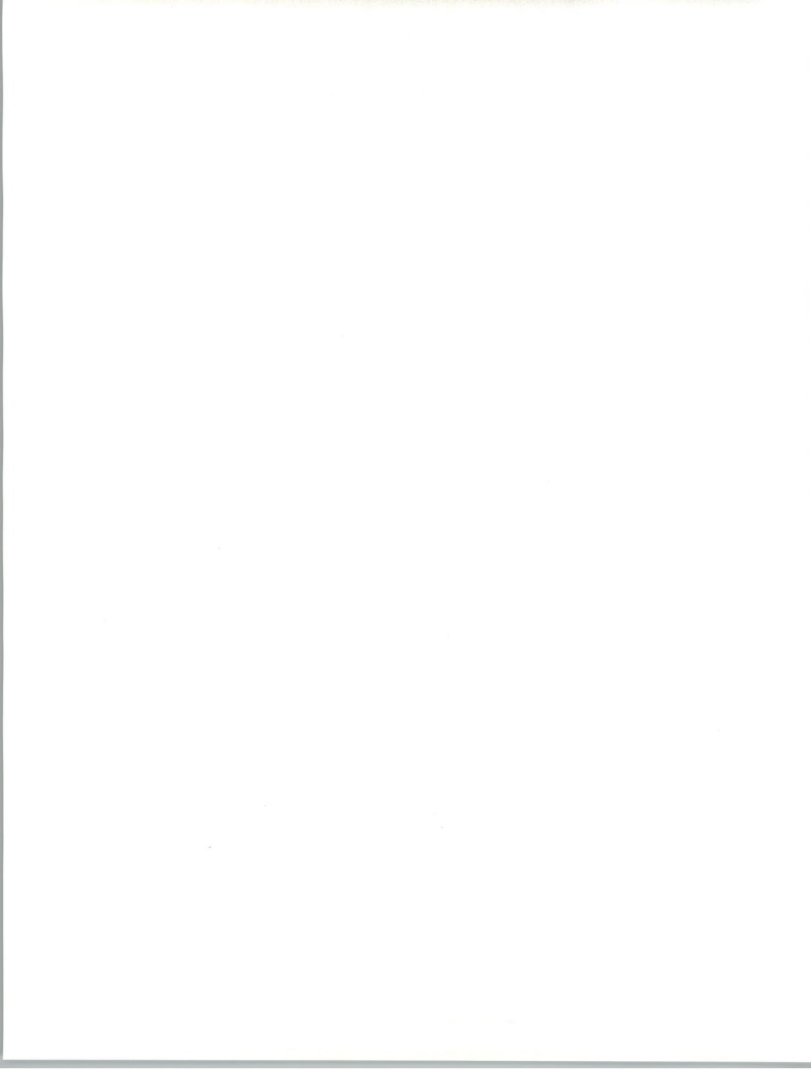
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INPUT's *Definition of Terms* provides the framework for all of INPUT's market analyses and forecasts of the information services industry. It is used for all U.S. programs. The structure defined in Exhibit A-1 is also used in Europe and for the worldwide forecast.

One of the strengths of INPUT's market analysis services is the consistency of the underlying market sizing and forecast data. Each year INPUT reviews its industry structure and makes changes if they are required. When changes are made they are carefully documented and the new definitions and forecasts reconciled to the prior definitions and forecasts. INPUT clients have the benefit of being able to track market forecast data from year to year against a proven and consistent foundation of definitions.

For 1992 INPUT has added one delivery mode and defined three new submodes to its Information Services Industry Structure:

- *Equipment Services* has been added as the ninth delivery mode. INPUT has forecasted the equipment maintenance, support and related services market through its Customer Services Programs for a number of years. Starting in 1992, the equipment services portion of the customer services market will be included in the total information services industry as defined by INPUT. Other portions of this market (such as software support) are already included.
- Two new submodes have been defined in the *Systems Operations* delivery mode - *desktop services* and *network management*. They are defined on pages 5 and 6.
- A fourth submode has been defined within the Professional Services delivery mode—*applications management*. This change reflects a shift in the way some software development and maintenance services are purchased. A complete definition is provided on page 6.



A series of definitions for computer equipment have also been added.

Changes from the 1991 INPUT *Definition of Terms* are indicated with a ☆.

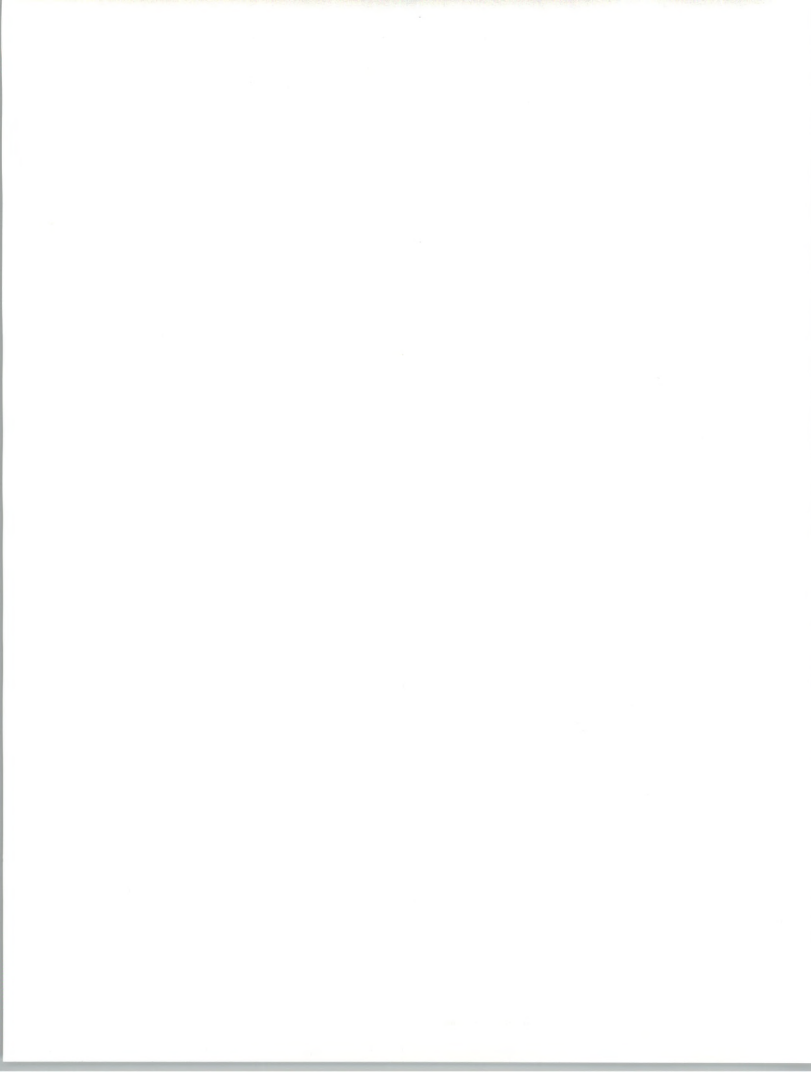
## B

### Overall Definitions and Analytical Framework

#### 1. Information Services

*Information Services* are computer/telecommunications-related products and services that are oriented toward the development or use of information systems. Information services typically involve one or more of the following:

- Use of vendor-provided computer processing services to develop or run applications or provide services such as disaster recovery or data entry (called *Processing Services*)
- A combination of computer equipment, packaged software and associated support services which will meet an application systems need (called *Turnkey Systems*)
- Packaged software products, including systems software or applications software products (called *Software Products*)
- People services that support users in developing and operating their own information systems (called *Professional Services*)
- The combination of products (software and equipment) and services where the vendor assumes total responsibility for the development of a custom integrated solution to an information systems need (called *Systems Integration*)
- Services that provide operation and management of all or a significant part of a user's information systems functions under a long-term contract (called *Systems Operations*)
- Services that support the delivery of information in electronic form—typically network-oriented services such as value-added networks, electronic mail and document interchange (called *Network Applications*)
- Services that support the access and use of public and proprietary information such as on-line data bases and news services (called *Electronic Information Services*)
- Services that support the operation of computer and digital communication equipment (called *Equipment Services*)



In general, the market for information services does not involve providing equipment to users. The exception is where the equipment is part of an overall service offering such as a turnkey system, a systems operations contract, or a systems integration project.

The information services market also excludes pure data transport services (i.e., data or voice communications circuits). However, where information transport is associated with a network-based service (e.g., electronic data interchange services), or cannot be feasibly separated from other bundled services (e.g., some systems operations contracts), the transport costs are included as part of the services market.

The analytical framework of the information services industry consists of the following interacting factors: overall and industry-specific business environment (trends, events and issues); technology environment; user information system requirements; size and structure of information services markets; vendors and their products, services and revenues; distribution channels; and competitive issues.

## 2. Market Forecasts/User Expenditures

All information services market forecasts are estimates of *User Expenditures* for information services. When questions arise about the proper place to count these expenditures, INPUT addresses them from the user's viewpoint: expenditures are categorized according to what users perceive they are buying.

By focusing on user expenditures, INPUT avoids two problems which are related to the distribution channels for various categories of services:

- Double counting, which can occur by estimating total vendor revenues when there is significant reselling within the industry (e.g., software sales to turnkey vendors for repackaging and resale to end users)
- Missed counting, which can occur when sales to end users go through indirect channels such as mail order retailers

*Captive Information Services User Expenditures* are expenditures for products and services provided by a vendor that is part of the same parent corporation as the user. These expenditures are not included in INPUT forecasts.

*Non-captive Information Services User Expenditures* are expenditures that go to vendors that have a different parent corporation than the user. It is these expenditures which constitute the information services market analyzed by INPUT and that are included in INPUT forecasts.



### 3. Delivery Modes

*Delivery Modes* are defined as specific products and services that satisfy a given user need. While *Market Sectors* specify *who* the buyer is, *Delivery Modes* specify *what* the user is buying.

Of the nine delivery modes defined by INPUT, six are considered primary products or services:

- *Processing Services*
- *Network Services*
- *Professional Services*
- *Applications Software Products*
- *Systems Software Products*
- *Equipment Services*

The remaining three delivery modes represent combinations of these products and services, combined with equipment, management and/or other services:

- *Turnkey Systems*
- *Systems Operations*
- *Systems Integration*

Section C describes the delivery modes and their structure in more detail.

### 4. Market Sectors

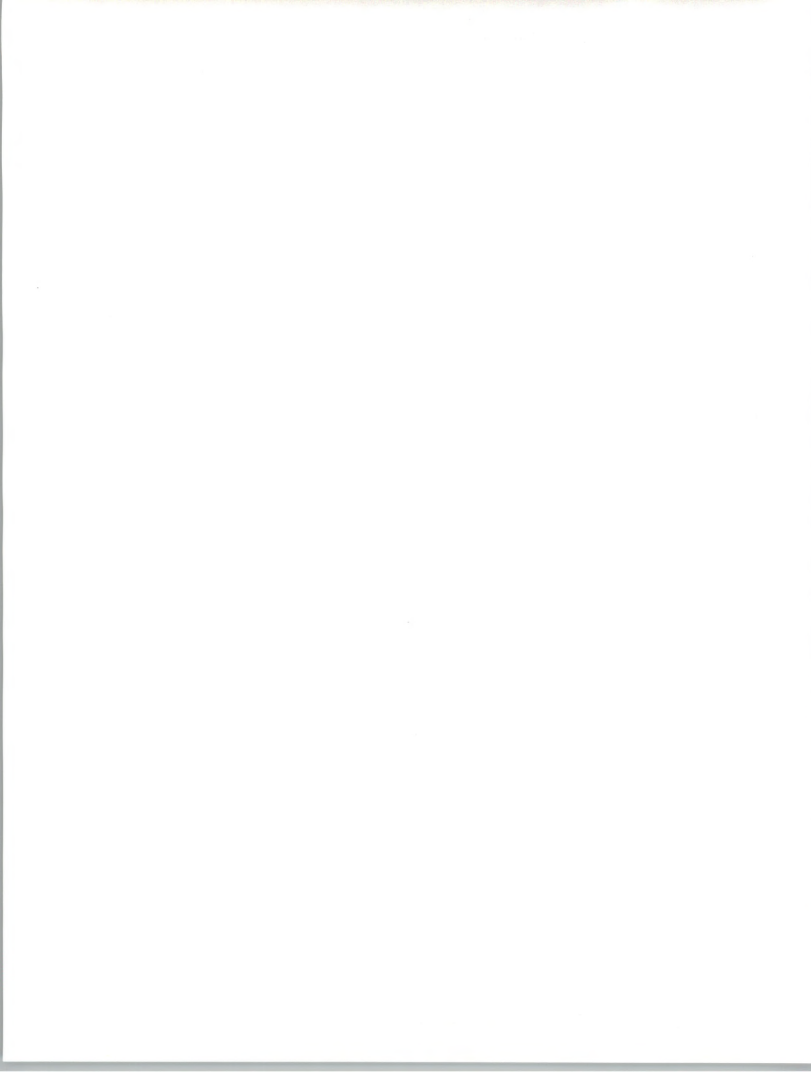
*Market Sectors* or markets are groupings or categories of the buyers of information services. There are three types of user markets:

- *Vertical Industry* markets, such as Banking, Transportation, Utilities, etc. These are called "industry-specific" markets.
- *Functional Application* markets, such as Human Resources, Accounting, etc. These are called "cross-industry" markets.
- *Other* markets, which are neither industry- nor application-specific, such as the market for systems software products and much of the on-line data base market.

Specific market sectors used by INPUT are defined in Section E, below.

### 5. Trading Communities

Information technology is playing a major role in re-engineering, not just companies but the value chain or *Trading Communities* in which these companies operate. This re-engineering is resulting in electronic commerce emerging where interorganizational electronic systems facilitate the business processes of the trading community.





- A trading community is the group or organizations—commercial and non-commercial—involved in producing a good or services.
- Electronic commerce and trading communities are addressed in INPUT's EDI and Electronic Commerce Program.

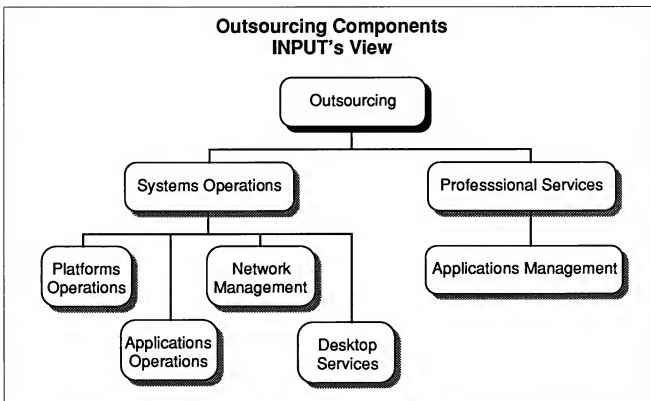
## 6. Outsourcing

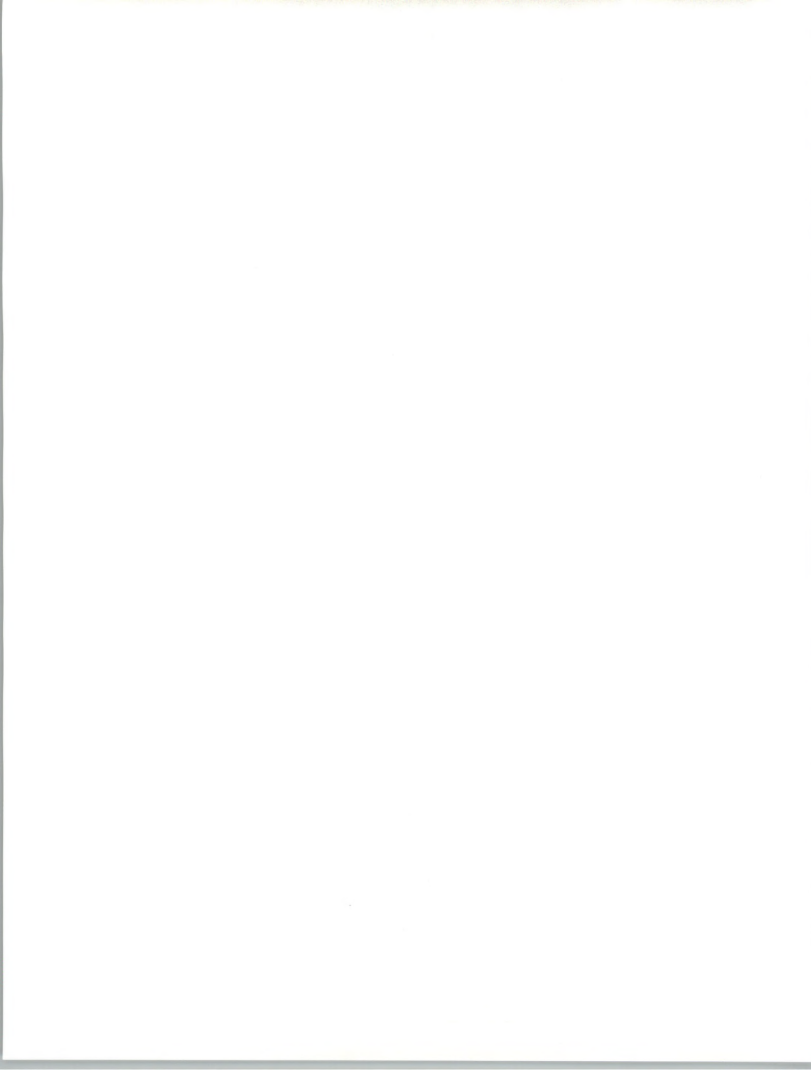
Over the past few years a major change has occurred in the way clients are buying some information services. The shift has been labeled *outsourcing*.

INPUT views outsourcing as a change in the form of the client/vendor relationship. Under an outsourcing relationship, all or a major portion of the information systems function is contracted to a vendor in a long-term relationship. The vendor is responsible for the performance of the function.

INPUT considers the following submodes to be outsourcing-type relationships and in aggregate to represent the outsourcing market. See Exhibit A-1. Complete definitions are provided in Section C of this document. INPUT provides these forecasts as part of the corresponding delivery modes.

EXHIBIT A-1





- *Platform Systems Operations* - The vendor is responsible for managing and operating the client's computer systems.
- *Applications System Operations* - The vendor is responsible for developing and/or maintaining a client's applications as well as operating the computer systems.
- ☆ *Network Management* - The vendor assumes full responsibility for operating and managing the client's data communications systems. This may also include the voice communications of the client.
- ☆ *Applications Management/Maintenance* - The professional services vendor has full responsibility for developing and/or maintaining some or all of the applications systems that a client uses to support business operations. The services are provided on a long-term contractual basis.
- ☆ *Desktop Services* - The vendor assumes responsibility for the deployment, maintenance, and connectivity between the personal computers and/or intelligent workstations in the client organization. The services may also include performing the help-desk function. The services are provided on a long-term contractual basis.

## C

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## Delivery Modes and Submodes

Exhibit A-2 provides the overall structure of the information services industry as defined and used by INPUT. This section of *Definition of Terms* provides definitions for each of the delivery modes and their submodes or components.

### 1. Software Products

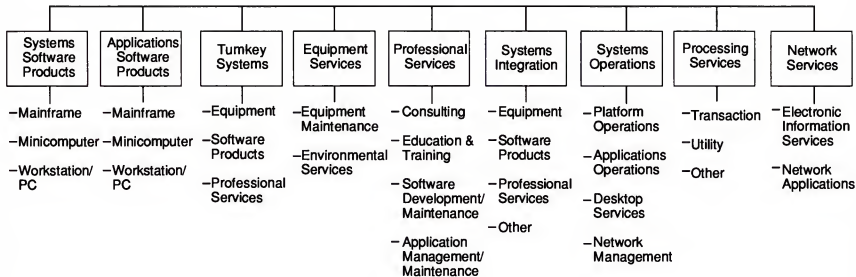
INPUT divides the software products market into two delivery modes: systems software and applications software.

The two delivery modes have many similarities. Both involve purchases of software packages for in-house computer systems. Included are both lease and purchase expenditures, as well as expenditures for work performed by the vendor to implement or maintain the package at the user's sites. Vendor-provided training or support in operation and use of the package, if part of the software pricing, is also included here.

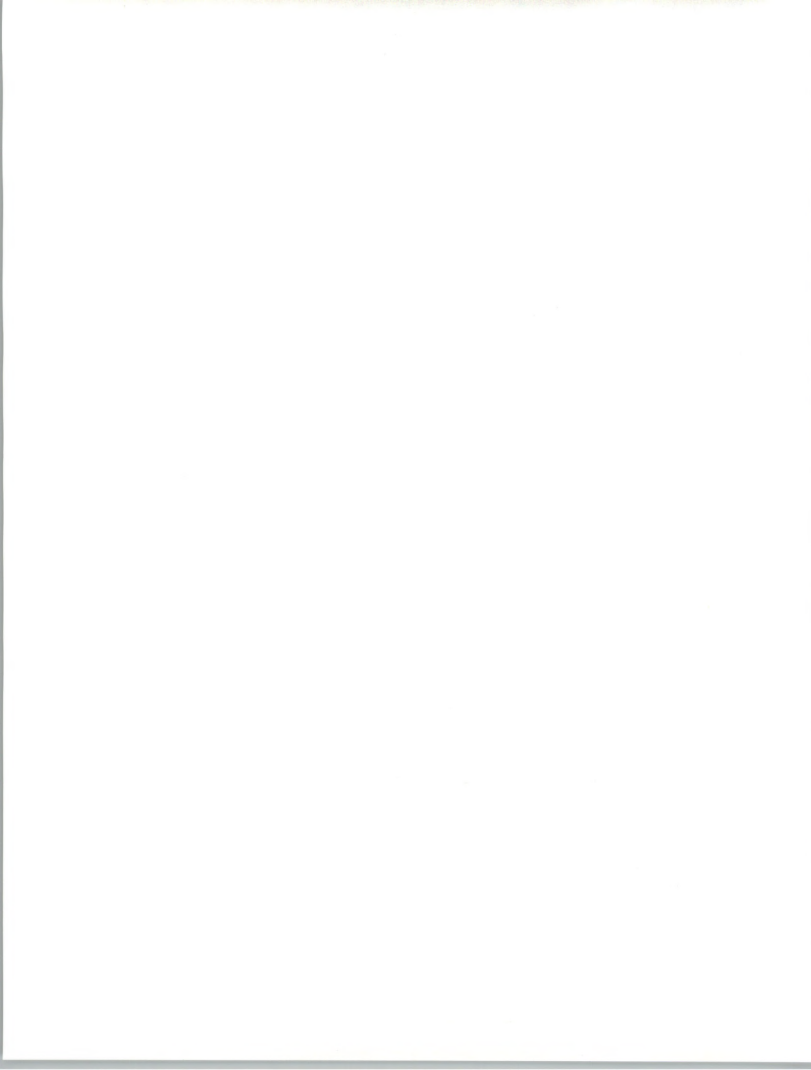
Expenditures for work performed by organizations other than the package vendor are counted in the professional services delivery mode. Fees for work related to education, consulting, and/or custom modification of software products are also counted as professional services, provided such fees are charged separately from the price of the software product itself.



## Information Services Industry Structure—1992



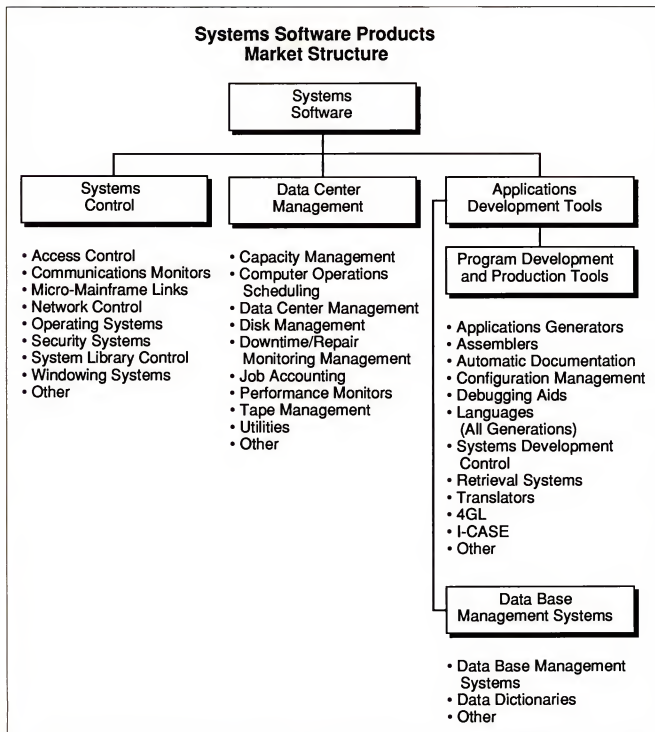
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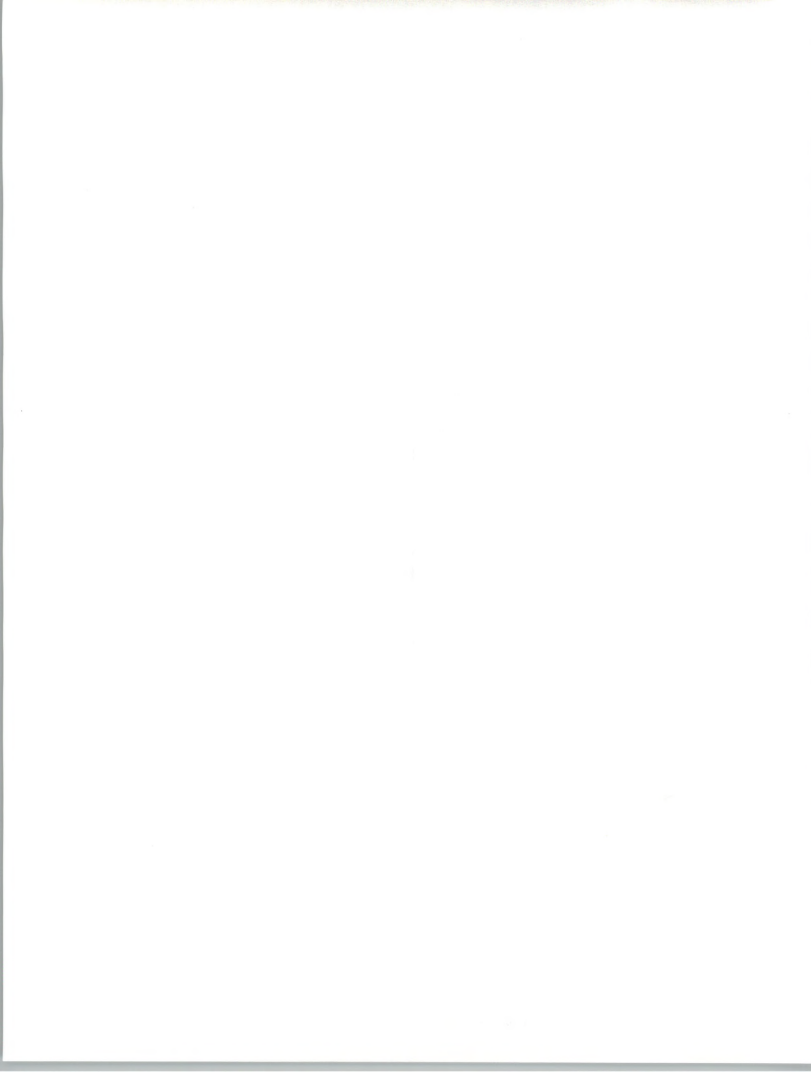


### a. Systems Software Products

Systems software products enable the computer/communications system to perform basic machine-oriented or user interface functions. INPUT divides systems software products into three submodes. See Exhibit A-3.

EXHIBIT A-3







- *Systems Control Products* - Software programs that manage computer system resources and control the execution of programs. These products include operating systems, emulators, network control, library control, windowing, access control, and spoolers.
- *Operations Management Tools* - Software programs used by operations personnel to manage the computer system and/or network resources and personnel more effectively. Included are performance measurement, job accounting, computer operation scheduling, disk management utilities, and capacity management.
- *Applications Development Tools* - Software programs used to prepare applications for execution by assisting in designing, programming, testing, and related functions. Included are traditional programming languages, 4GLs, data dictionaries, data base management systems, report writers, project control systems, CASE systems and other development productivity aids.

INPUT also forecasts the systems software products delivery mode by platform level: mainframe, minicomputer and workstation/PC.

#### **b. Applications Software Products**

Applications software products enable a user or group of users to support an operational or administrative process within an organization. Examples include accounts payable, order entry, project management and office systems. INPUT categorizes applications software products into two groups of market sectors. (See Exhibit A-4.)

- *Industry Applications Software Products* - Software products that perform functions related to fulfilling business or organizational needs unique to a specific industry (vertical) market and sold to that market only. Examples include demand deposit accounting, MRPII, medical record keeping, automobile dealer parts inventory, etc.
- *Cross-Industry Applications Software Products* - Software products that perform a specific function that is applicable to a wide range of industry sectors. Examples include payroll and human resource systems, accounting systems, word processing and graphics systems, spreadsheets, etc.

INPUT also forecasts the applications software products delivery mode by platform level: mainframe, minicomputer and workstation/PC.

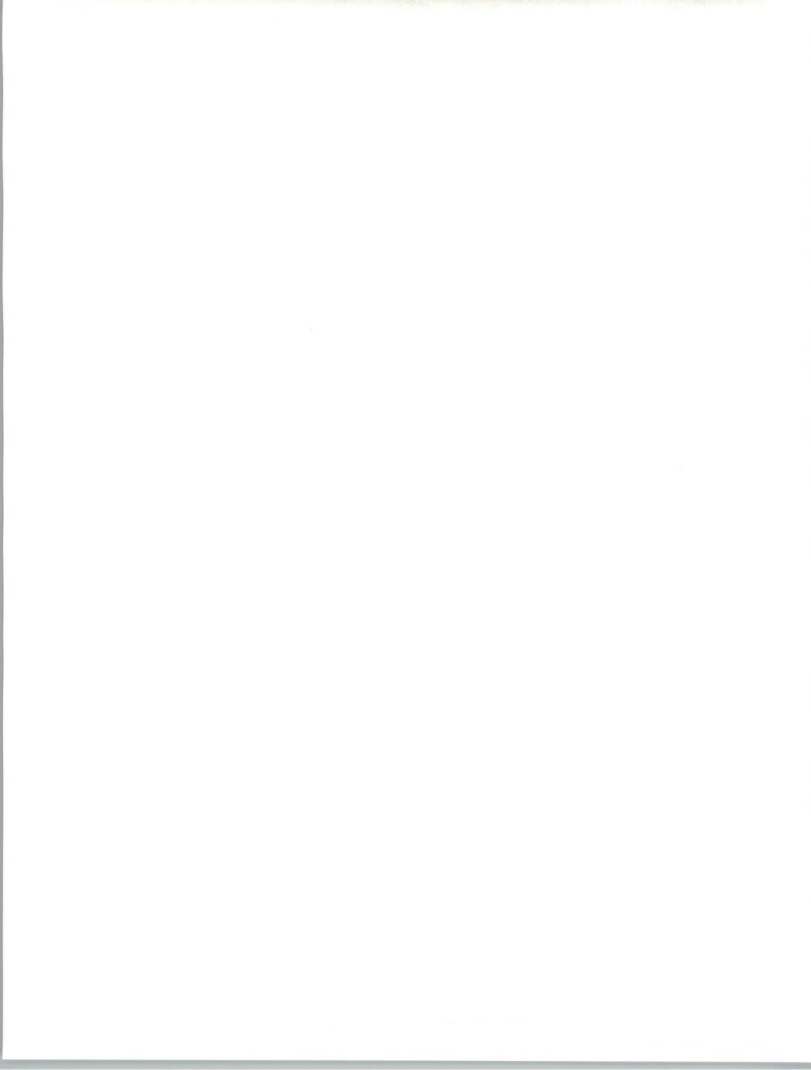
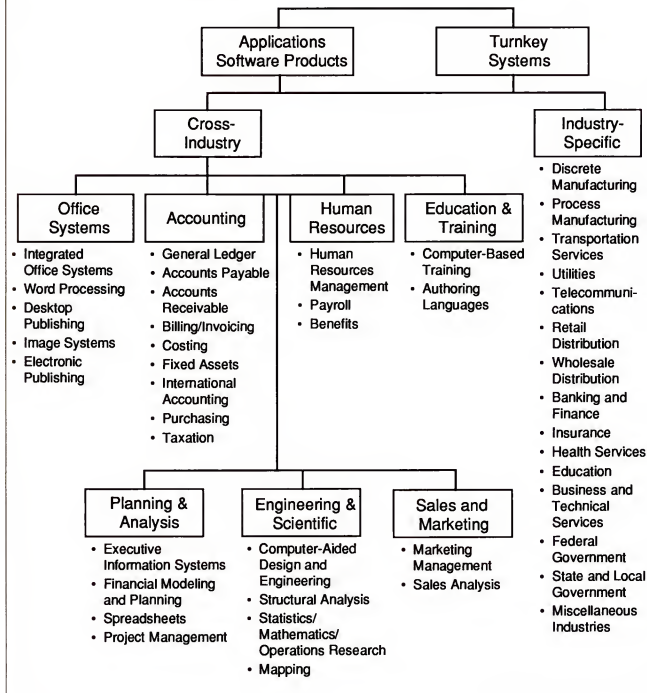
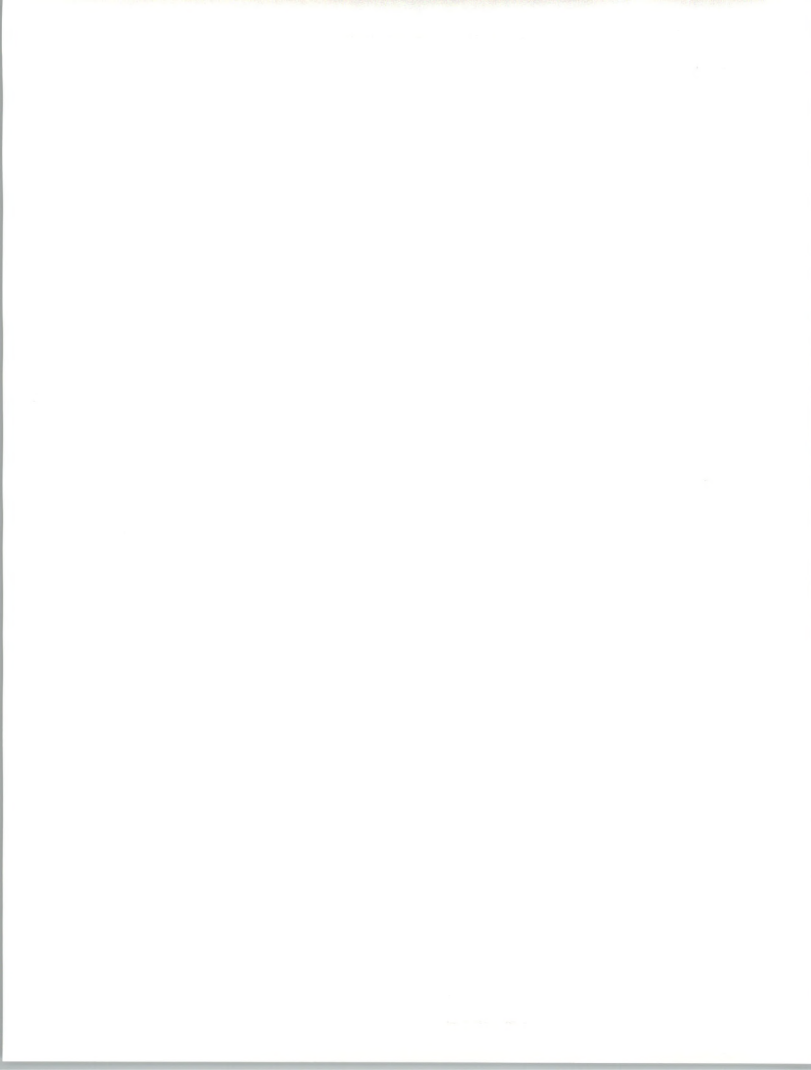


EXHIBIT A-4

## Application Products and Turnkey Systems





## 2. Turnkey Systems

A turnkey system is an integration of equipment (CPU, peripherals, etc.), systems software, and packaged applications software into a single product developed to meet a specific set of user requirements. Value added by the turnkey system vendor is primarily in the software and professional services provided. INPUT categorizes turnkey systems into two groups of market sectors as it does for applications software products. (See Exhibit A-4.)

Most CAD/CAM systems and many small business systems are turnkey systems. Turnkey systems utilize standard computers and do not include specialized hardware such as word processors, cash registers, process control systems, or embedded computer systems for military applications.

Computer manufacturers (e.g., IBM or DEC) that combine software with their own general-purpose hardware are not classified by INPUT as turnkey vendors. Their software revenues are included in the appropriate software category.

Most turnkey systems are sold through channels known as value-added resellers.

- *Value-Added Reseller (VAR):* A VAR adds value to computer hardware and/or software and then resells it to an end user. The major value added is usually applications software for a vertical or cross-industry market, but also includes many of the other components of a turnkey systems solution, such as professional services, software support, and applications upgrades.

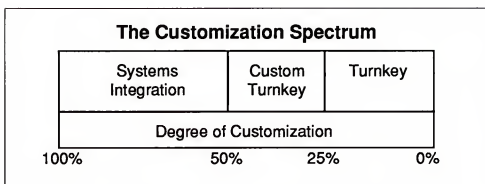
Turnkey systems have three components:

- Equipment - computer hardware supplied as part of the turnkey system
- Software products - prepackaged systems and applications software products
- Professional services - services to install or customize the system or train the user, provided as part of the turnkey system sale

Exhibit A-5 contrasts turnkey systems with systems integration. Turnkey systems are based on available software products that a vendor may modify to a modest degree.



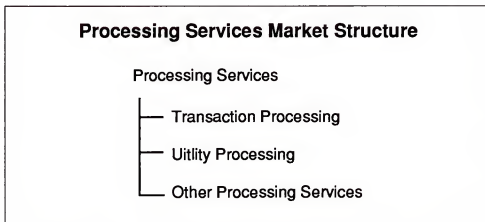
EXHIBIT A-5



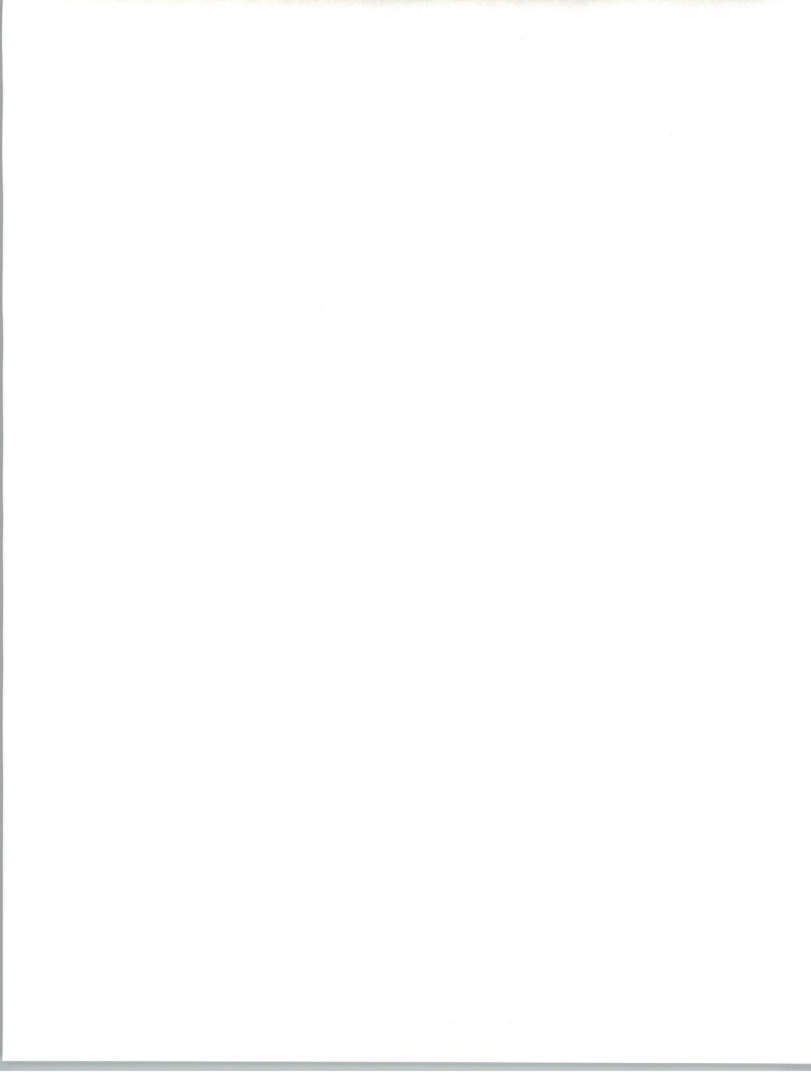
### 3. Processing Services

This delivery mode includes three submodes: transaction processing, utility processing, and "other" processing services. See Exhibit A-6.

EXHIBIT A-6



- *Transaction Processing* - Client uses vendor-provided information systems—including hardware, software and/or data networks—at the vendor site or customer site to process specific applications and update client data bases. The application software is typically provided by the vendor.
- *Utility Processing* - Vendor provides basic software tools (language compilers, assemblers, DBMSs, graphics packages, mathematical models, scientific library routines, etc.), enabling clients to develop and/or operate their own programs or process data on the vendor's system.
- *Other Processing Services* - Vendor provides service—usually at the vendor site—such as scanning and other data entry services, laser printing, computer output microfilm (COM), CD preparation and other data output services, backup and disaster recovery, etc.





#### 4. Systems Operations

Systems operations as a delivery mode was introduced in the 1990 Market Analysis and Systems Operations programs. Previously called Facilities Management, this delivery mode was created by taking the Systems Operations submode out of both Processing Services and Professional Services. For 1992 the submodes have been defined as follows.

Systems operations involves the operation and management of all or a significant part of the client's information systems functions under a long-term contract. These services can be provided in either of two distinct submodes where the difference is whether the support of applications, as well as data center operations, is included.

- *Platform systems operations* - The vendor manages and operates the computer systems, to perform the client's business functions, without taking responsibility for the client's application systems.
- *Applications systems operations* - The vendor manages and operates the computer systems to perform the client's business functions, and is also responsible for maintaining, or developing and maintaining, the client's application systems.

☆ *Network Management* - The vendor assumes responsibility for operating and managing the client's data communications systems. This may also include the voice communications of the client. A network management outsourcing contract may include only the management services or the full costs of the communications services and equipment plus the management services.

☆ *Desktop Services* - The vendor assumes responsibility for the deployment, maintenance, and connectivity among the personal computers and/or workstations in the client organization. The services may also include performing the help-desk function. Equipment as well as services can be part of a desktop services outsourcing contract.

Note: This type of client service can also be provided through traditional professional services where the contractual criteria of outsourcing are not present.

Systems operations vendors now provide a wide variety of services in support of existing information systems. The vendor can plan, control, provide, operate, maintain and manage any or all components of the client's information systems environment (equipment, networks, applications systems), either at the client's site or the vendor's site.



Note: In the federal government market, systems operation services are also defined by equipment ownership with the terms "COCO" (Contractor-Owned, Contractor-Operated), and "GOCO" (Government-Owned, Contractor-Operated).

## 5. Systems Integration (SI)

Systems integration is a vendor service that provides a complete solution to an information system, networking or automation development requirement through the custom selection and implementation of a variety of information system products and services. A systems integrator is responsible for the overall management of a systems integration contract and is the single point of contact and responsibility to the buyer for the delivery of the specified system function, on schedule and at the contracted price. (Refer to Exhibit A-7.)

The components of a systems integration project are the following:

- *Equipment* - information processing and communications equipment required to build the systems solution. This component may include custom as well as off-the-shelf equipment to meet the unique needs of the project. The systems integration equipment category excludes turnkey systems by definition.
- *Software products* - prepackaged applications and systems software products.
- *Professional services* - the value-added component that adapts the equipment and develops, assembles, or modifies the software and hardware to meet the system's requirements. It includes all of the professional services activities required to develop, implement, and if included in the contract, operate an information system, including consulting, program/project management, design and integration, software development, education and training, documentation, and systems operations and maintenance.
- *Other services* - most systems integration contracts include other services and product expenditures that are not classified elsewhere. This category includes miscellaneous items such as engineering services, automation equipment, computer supplies, business support services and supplies, and other items required for a smooth development effort.



## EXHIBIT A-7

**Products/Services in  
Systems Integration Projects***Equipment*

- Information systems
- Communications

*Software Products*

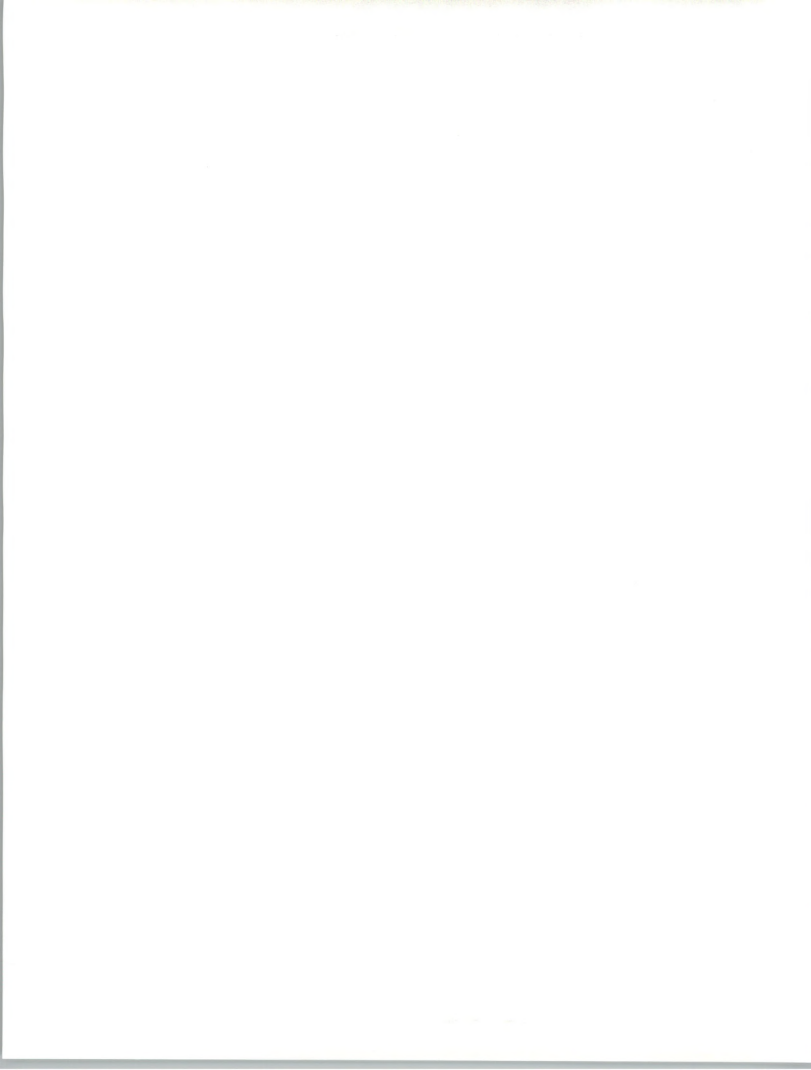
- Systems software
- Applications software

*Professional Services*

- Consulting
  - Feasibility and trade-off studies
  - Selection of equipment, network and software
- Program/project management
- Design/integration
  - Systems design
  - Installation of equipment, network, and software
  - Demonstration and testing
- Software development
  - Modification of software packages
  - Modification of existing software
  - Custom development of software
- Education/training and documentation
- Systems operations/maintenance

*Other Miscellaneous Products/Services*

- Site preparation
- Data processing supplies
- Processing/network services
- Data/voice communication services



## 6. Professional Services

This category includes four submodes: consulting, education and training, software development, and applications management. Exhibit A-8 provides additional detail.

- *Consulting:* Services include management consulting (related to information systems), information systems re-engineering, information systems consulting, feasibility analysis and cost-effectiveness studies, and project management assistance. Services may be related to any aspect of the information system, including equipment, software, networks and systems operations.
  - *Education and Training:* Services that provide training and education or the development of training materials related to information systems and services for the information systems professional and the user, including computer-aided instruction, computer-based education, and vendor instruction of user personnel in operations, design, programming, and documentation. Education and training provided by school systems are not included. General education and training products are included as a cross-industry market sector.
  - *Software Development:* Services include user requirements definition, systems design, contract programming, documentation, and implementation of software performed on a custom basis. Conversion and maintenance services are also included.
- ☆ *Applications Management:* The vendor has full responsibility for maintaining and upgrading some or all of the application systems that a client uses to support business operations and may develop and implement new application systems for the client.

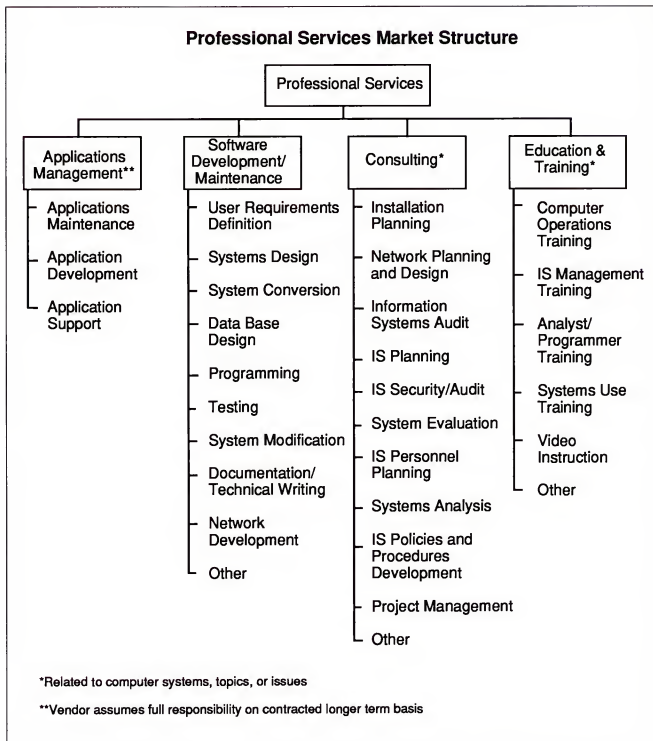
An applications management contract differs from traditional software development in the form of the client/vendor relationship. Under traditional software development services the relationship is project based. Under applications management it is time and function based.

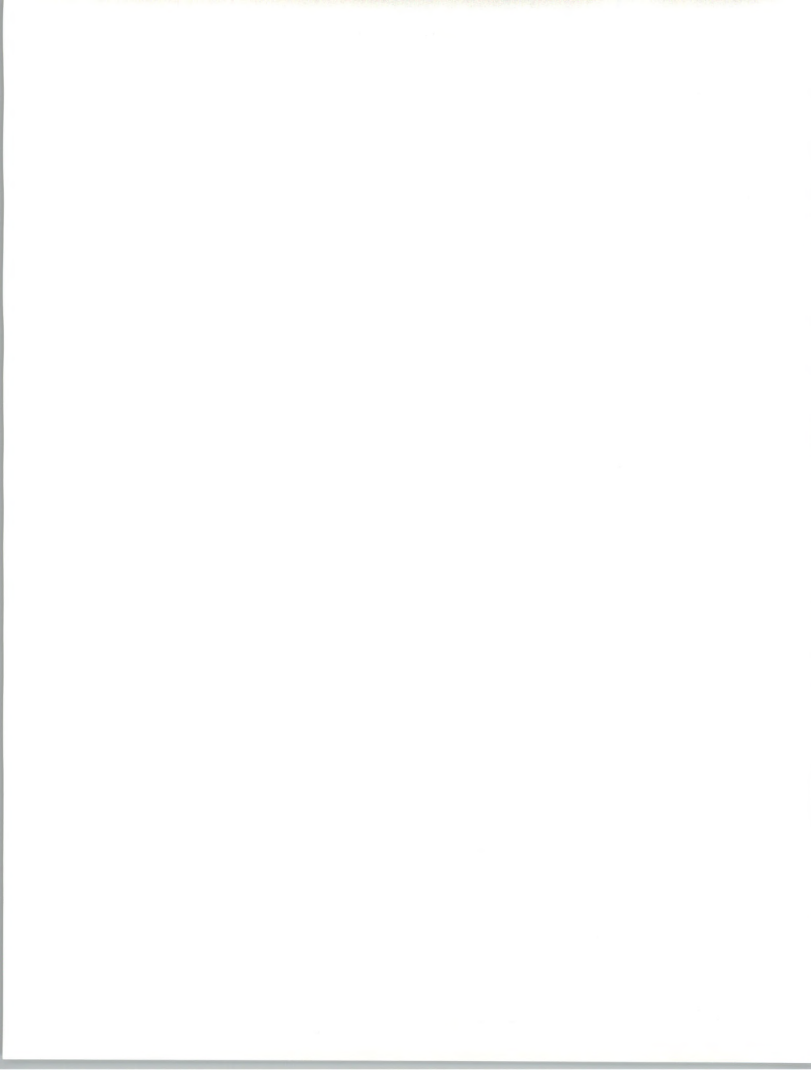
These services may be provided in combination or separately from platform systems operations.





EXHIBIT A-8

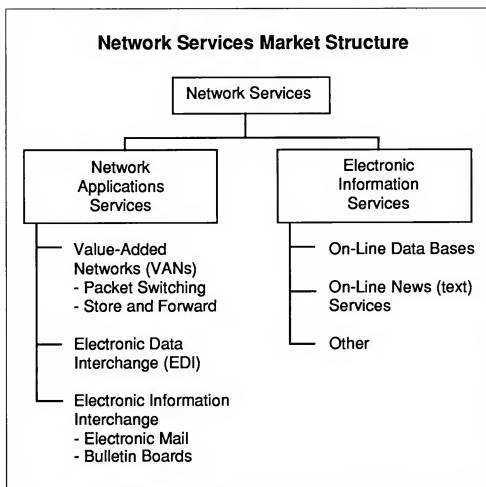




## 7. Network Services

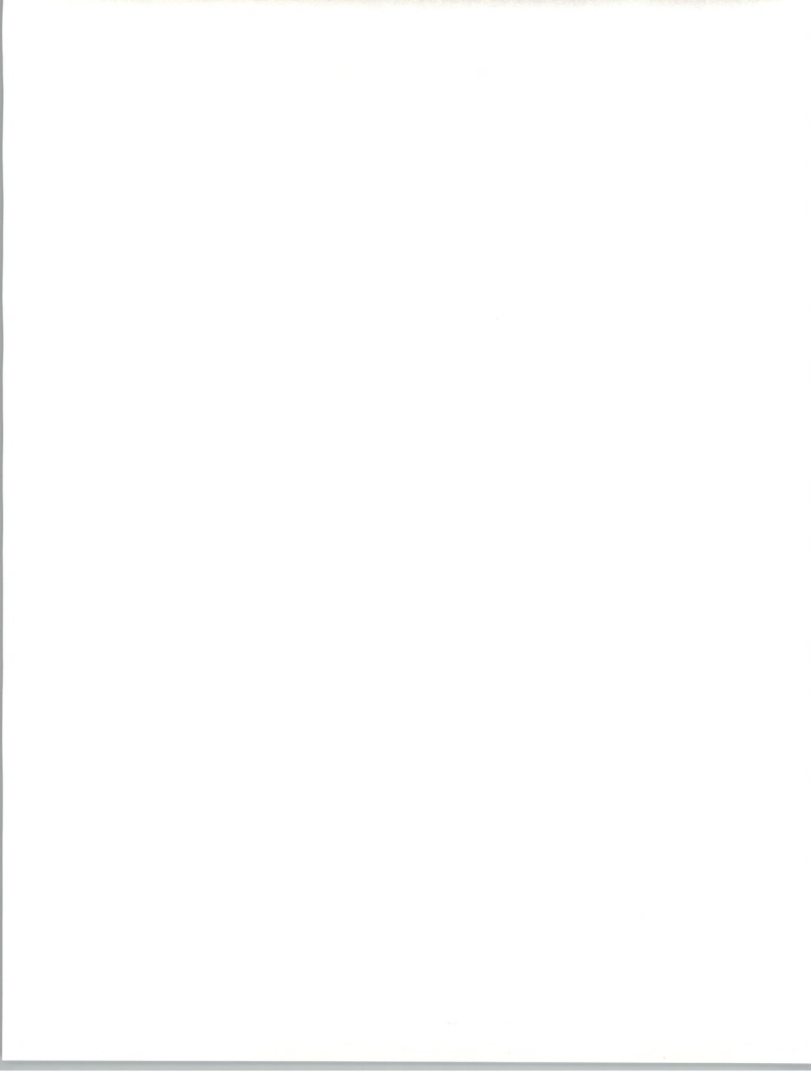
Network services are a variety of telecommunications-based functions and operations. Network service includes two submodes, as shown in Exhibit A-9.

EXHIBIT A-9



### a. Electronic Information Services

Electronic information services are data bases that provide specific information via terminal- or computer-based inquiry, including items such as stock prices, legal precedents, economic indicators, periodical literature, medical diagnosis, airline schedules, automobile valuations, etc. The terminals used may be computers themselves, such as communications servers or personal computers.



Users inquire into and extract information from the data bases. They may load extracted data into their own computer systems; the vendor does not provide data processing or manipulation capability as part of the electronic information service and users cannot update the vendor's data bases. However, the vendor may offer other services (network applications or processing services) that do offer processing or manipulation capability.

The two kinds of electronic information services are:

- *On-line Data Bases* - Structured, primarily numerical data on economic and demographic trends, financial instruments, companies, products, materials, etc.
- Unstructured, primarily textual information on people, companies, events, etc. These are often news services.

While electronic information services have traditionally been delivered via networks, there is a growing trend toward the use of CD ROM optical disks to support or supplant on-line services, and these optical disk-based systems are included in the definition of this delivery mode.

#### **b. Network Applications**

*Value-Added Network Services (VAN Services)* - VAN services are enhanced transport services which involve adding such functions as automatic error detection and correction, protocol conversion, and store-and-forward message switching to the provision of basic network circuits.

While VAN services were originally provided only by specialized VAN carriers (Tymnet, Telenet, etc.), today these services are also offered by traditional common carriers (AT&T, Sprint, etc.). Meanwhile, the VAN carriers have also branched into the traditional common carriers' markets and are offering unenhanced basic network circuits as well.

*Electronic Data Interchange (EDI)* - Application-to-application electronic exchange of business data between trade partners or facilitators using a telecommunications network.

*Electronic Information Interchange* - The transmission of messages across an electronic network managed by a services vendor, including electronic mail, voice mail, voice messaging, and access to Telex, TWX, and other messaging services. This also includes bulletin board services.



## 8. Equipment Services

- ☆The equipment services delivery mode includes two submodes. Both deal with the support and maintenance of computer equipment.
- ☆*Equipment Maintenance* - Services provided to repair, diagnose problems and provide preventive maintenance both on-site and off-site for computer equipment. The costs of parts, media and other supplies are excluded. These services are typically provided on a contract basis.
- ☆*Environmental Services* - Composed of equipment and data center related special services such as cabling, air conditioning and power supply, equipment relocation and similar services.

## D

### Computer Equipment

- ☆These definitions have been included to provide the basis for market segmentation in the software products markets.
- ☆*Computer Equipment* - Includes all computer and telecommunications equipment that can be separately acquired with or without installation by the vendor and not acquired as part of an integrated system. Unless otherwise noted in an INPUT forecast, computer equipment is only included where it is part of the purchase of services or software products (e.g., turnkey systems and systems integration).
- ☆*Peripherals* - Includes all input, output, communications, and storage devices (other than main memory) that can be channel connected to a processor, and generally cannot be included in other categories such as terminals.
- ☆*Input Devices* - Includes keyboards, numeric pads, card readers, light pens and track balls, tape readers, position and motion sensors, and analog-to-digital converters.
- ☆*Output Devices* - Includes printers, CRTs, projection television screens, micrographics processors, digital graphics, and plotters
- ☆*Communication Devices* - Includes modem, encryption equipment, special interfaces, and error control
- ☆*Storage Devices* - Includes magnetic tape (reel, cartridge, and cassette), floppy and hard disks, solid state (integrated circuits), and bubble and optical memories





☆ *Computer Systems* - Includes all processors from personal computers to supercomputers. Computer systems may require type- or model-unique operating software to be functional, but this category excludes applications software and peripheral devices and processors or CPUs not provided as part of an integrated (turnkey) system.

☆ *Personal computers* - Smaller computers using 8-, 16-, or 32-bit computer technology. Generally designed to sit on a desktop and are portable for individual use. Price generally less than \$5,000.

☆ *Workstations* - High-performance, desktop, single-user computers often employing Reduced Instruction Set Computing (RISC). Workstations provide integrated, high-speed, local network-based services such as data base access, file storage and back-up, remote communications, and peripheral support. These products usually cost from \$5,000 to \$15,000.

☆ *Minicomputer or midsize computers* - Minicomputers are generally priced from \$15,000 to \$350,000. Many of the emerging client/server computers are in this category.

☆ *Mainframe or large computers* - Traditional mainframe and supercomputers costing more than \$350,000.

## E

### Sector Definitions

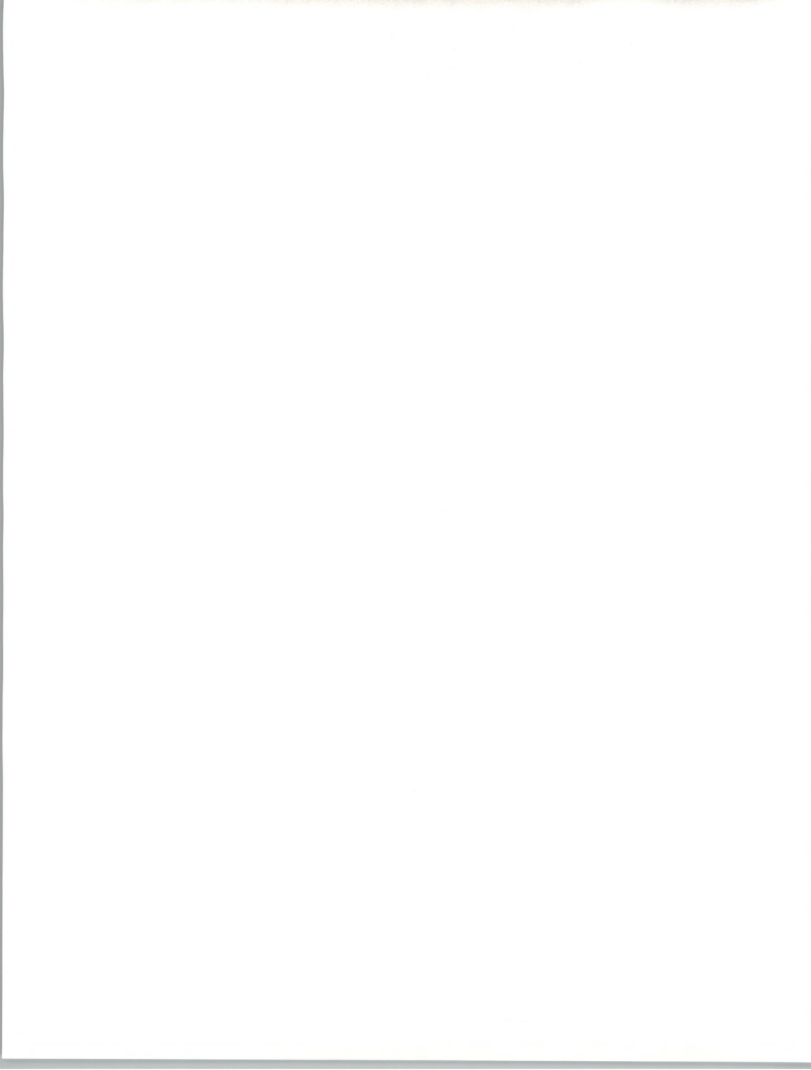
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#### 1. Industry Sector Definitions

INPUT structures the information services market into industry sectors such as process manufacturing, insurance, transportation, etc. The definitions of these sectors are based on the 1987 revision of the Standard Industrial Classification (SIC) code system. The specific industries (and their SIC codes) included under these industry sectors are detailed in Exhibit A-10.

INPUT includes all delivery modes except systems software products and equipment services in industry market sectors. See Exhibit A-9 and section E-3 (Delivery Mode Reporting by Sector).

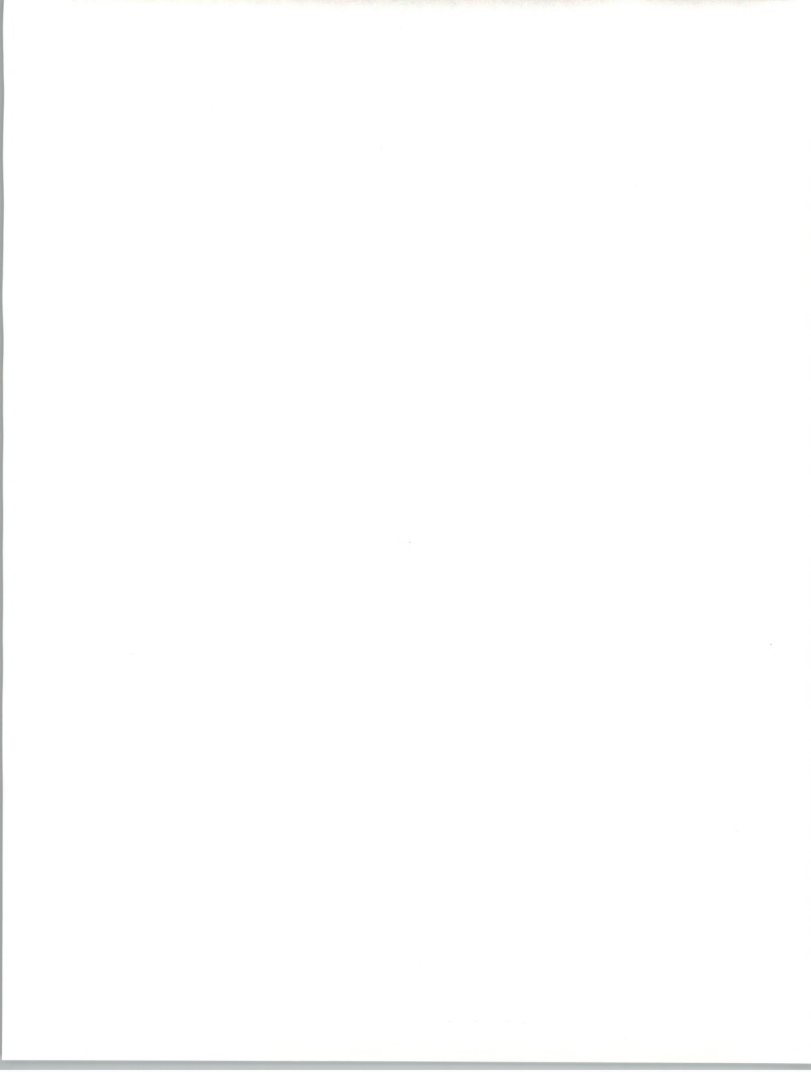
Note: SIC code 88 is Personal Households. INPUT does not currently analyze or forecast information services in this market sector.



## EXHIBIT A-10

## Industry Sector Definitions

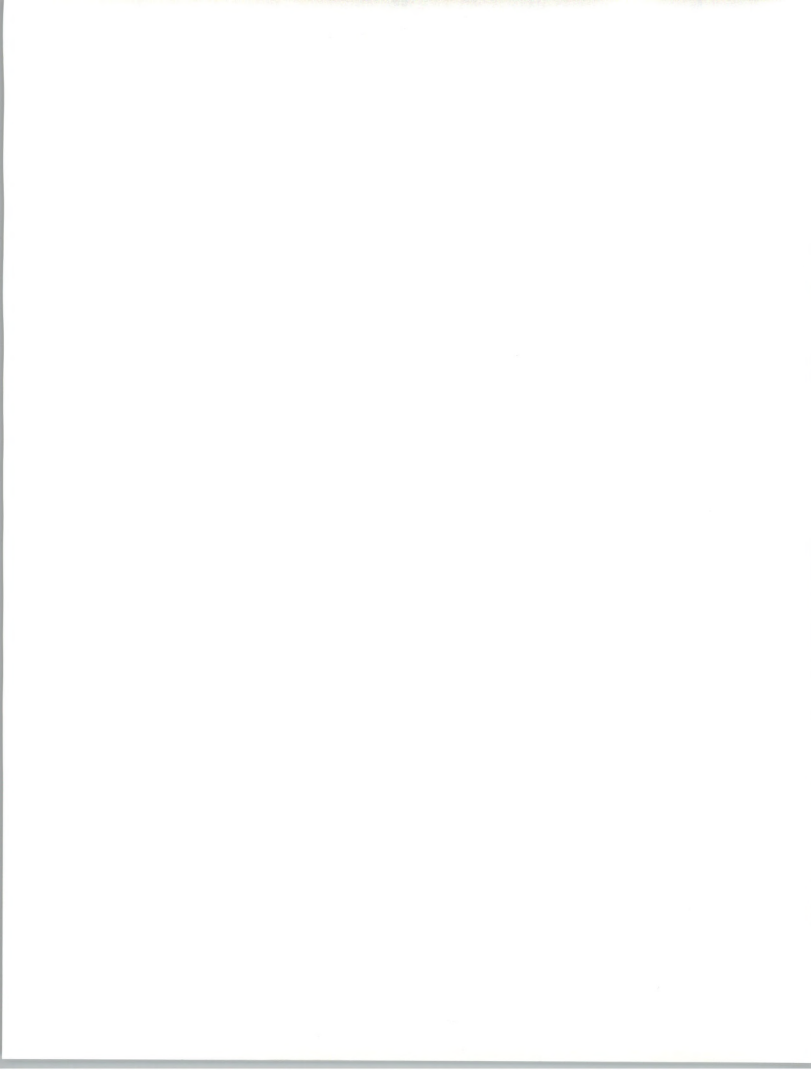
Industry Sector	SIC Code	Description
Discrete Manufacturing	23xx	Apparel and other finished products
	25xx	Furniture and fixtures
	27xx	Printing, publishing and allied industries
	31xx	Leather and leather products
	34xx	Fabricated metal products, except machinery and transportation equipment
	35xx	Industrial and commercial machinery and computer equipment
	36xx	Electronic and other electrical equipment and components, except computer equipment
	37xx	Transportation equipment
	38xx	Instruments; photo/med/optical goods; watches/clocks
	39xx	Miscellaneous manufacturing industry
Process Manufacturing	10xx	Metal mining
	12xx	Coal mining
	13xx	Oil and gas extraction
	14xx	Mining/quarrying nonmetallic minerals
	20xx	Food and kindred products
	21xx	Tobacco products
	22xx	Textile mill products
	24xx	Lumber and wood products, except furniture
	26xx	Paper and allied products
	28xx	Chemicals and allied products
	29xx	Petroleum refining and related industries
	30xx	Rubber and miscellaneous plastic products
	32xx	Stone, clay, glass and concrete products
	33xx	Primary metal industries
Transportation Services	40xx	Railroad transport
	41xx	Public transit/transport
	42xx	Motor freight transport/warehousing
	43xx	U.S. Postal Service
	44xx	Water transportation
	45xx	Air transportation (including airline reservation services in 4512)
	46xx	Pipelines, except natural gas
	47xx	Transportation services (including 472x, arrangement of passenger transportation)



## EXHIBIT A-10 (CONT.)

## Industry Sector Definitions

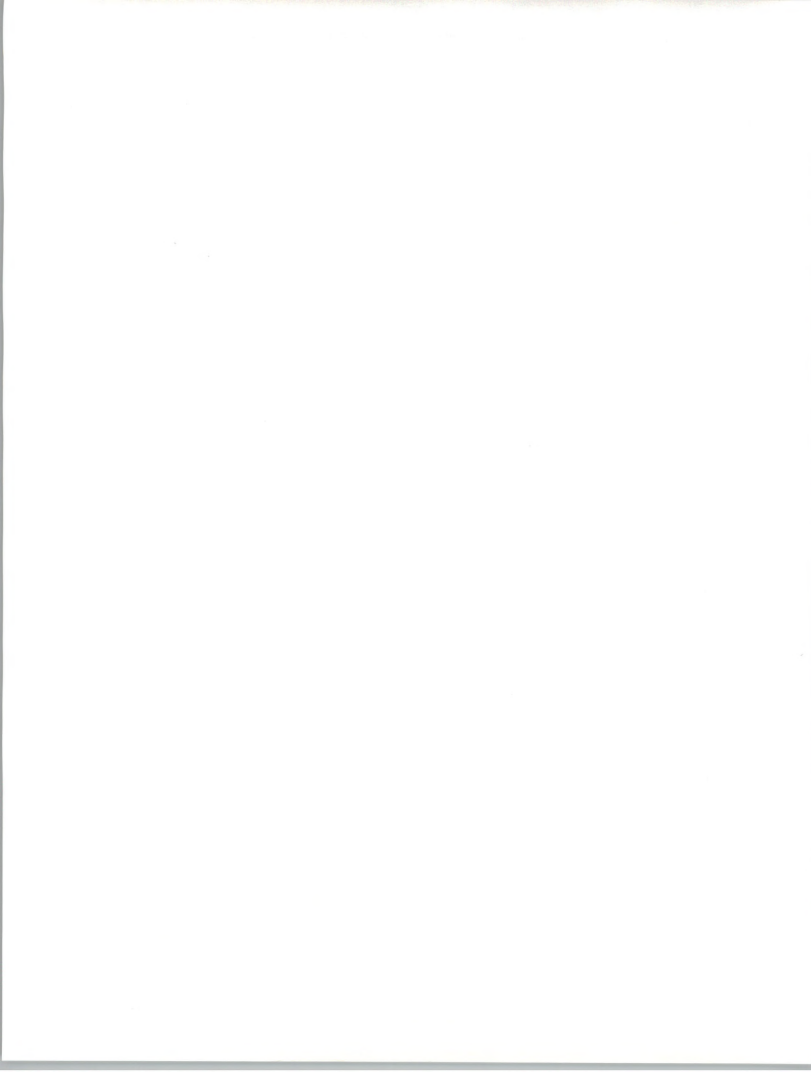
Industry Sector	SIC Code	Description
Telecommunications	48xx	Communications
Utilities	49xx	Electric, gas and sanitary services
Retail Distribution	52xx 53xx 54xx 55xx 56xx 57xx  58xx 59xx	Building materials General merchandise stores Food stores Automotive dealers, gas stations Apparel and accessory stores Home furniture, furnishings and accessory stores Eating and drinking places Miscellaneous retail
Wholesale Distribution	50xx 51xx	Wholesale trade - durable goods Wholesale trade - nondurable goods
Banking and Finance	60xx 61xx 62xx  67xx	Depository institutions Nondepository institutions Security and commodity brokers, dealers, exchanges and services Holding and other investment offices
Insurance	63xx 64xx	Insurance carriers Insurance agents, brokers and services
Health Services	80xx	Health services
Education	82xx	Educational services



## EXHIBIT A-10 (CONT.)

## Industry Sector Definitions

Industry Sector	SIC Code	Description
Business Services	65xx	Real estate
	70xx	Hotels, rooming houses, camps, and other lodging places
	72xx	Personal services
	73xx	Business services (except hotel reservation services in 7389)
	7389x	Hotel reservation services
	75xx	Automotive repair, services and parking
	76xx	Miscellaneous repair services
	78xx	Motion pictures
	79xx	Amusement and recreation services
	81xx	Legal services
	83xx	Social services
	84xx	Museums, art galleries, and botanical/zoological gardens
	86xx	Membership organizations
	87xx	Engineering, accounting, research, management, and related services
	89xx	Miscellaneous services
Federal Government	9xxx	
State and Local Government	9xxx	
Miscellaneous Industries	01xx	Agricultural production - crops
	02xx	Agricultural production - livestock/animals
	07xx	Agricultural services
	08xx	Forestry
	09xx	Fishing, hunting and trapping
	15xx	Building construction - general contractors, operative builders
	16xx	Heavy construction - contractors
	17xx	Construction - special trade contractors





## 2. Cross-Industry Sector Definitions

INPUT has identified seven cross-industry market sectors. These sectors or markets involve multi-industry applications such as human resource systems, accounting systems, etc.

- In order to be included in an industry sector, the service or product delivered must be specific to that sector only. If a service or product is used in more than one industry sector, it is counted as cross-industry.
- INPUT only includes the turnkey systems, applications software products, and transaction processing services in the cross-industry sectors.

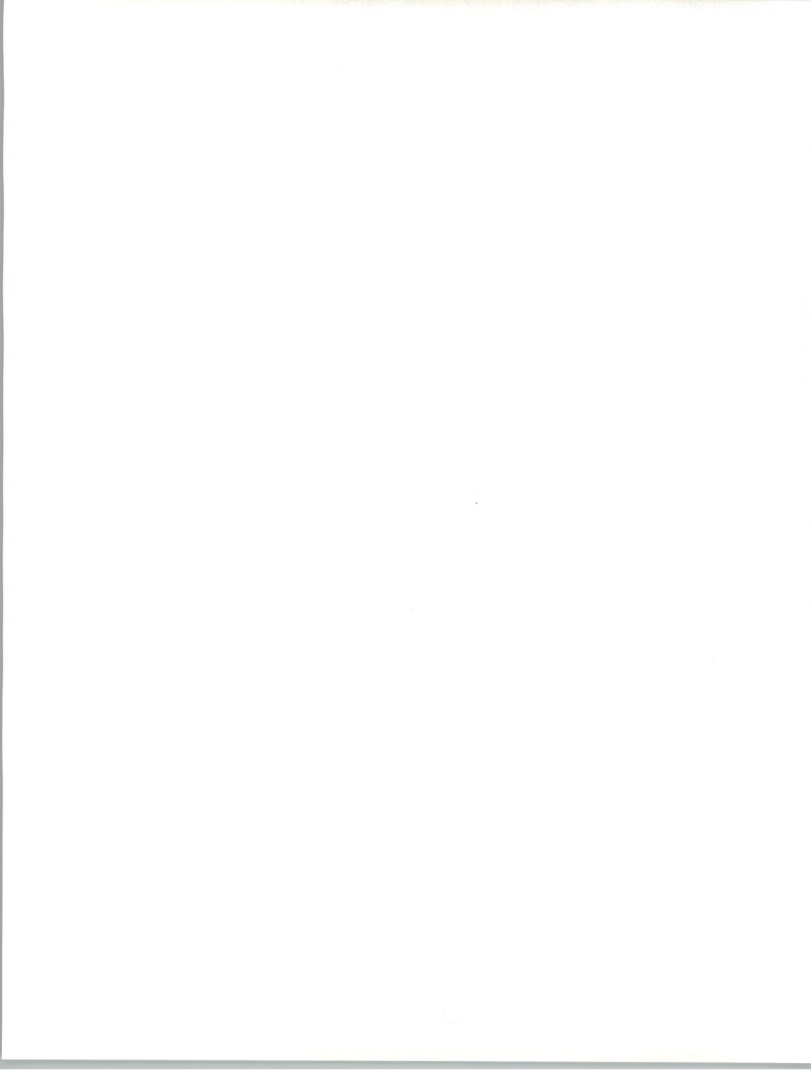
The seven cross-industry markets are:

*Accounting* - consists of applications software products and information services that serve such functions as:

- General ledger
  - Financial management
  - Accounts payable
  - Accounts receivable
  - Billing/invoicing
  - Fixed assets
  - International accounting
  - Purchasing
  - Taxation
  - Financial consolidation
- Excluded are accounting products and services directed to a specific industry, such as tax processing services for CPAs and accountants within the business services industry sector.

*Human Resources* - consists of application solutions purchased by multiple industry sectors to serve the functions of human resources management and payroll. Examples of specific applications within these two major functions are:

- Employee relations
- Benefits administration
- Government compliance
- Manpower planning
- Compensation administration
- Applicant tracking
- Position control
- Payroll processing



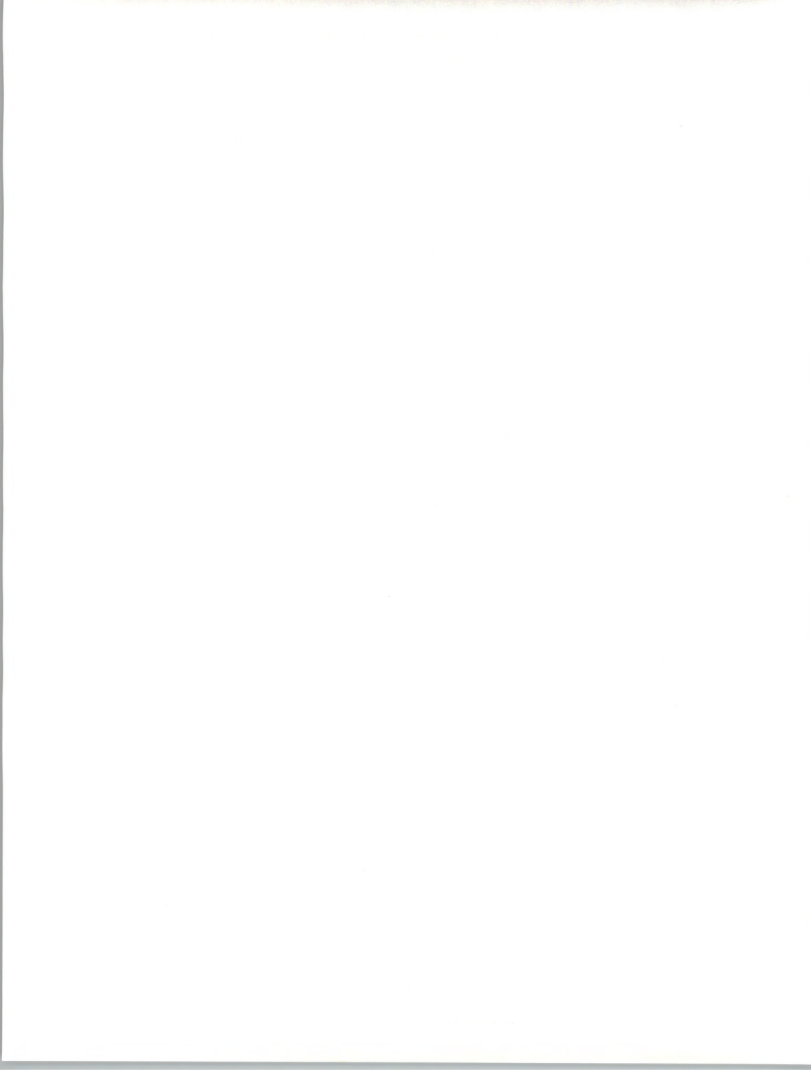
*Education and Training* - consists of education and training for information systems professionals and users of information systems delivered as a software product, turnkey system or through processing services. The market for computer-based training tools for the training of any employee on any subject is also included.

*Office Systems* consists of the following:

- Integrated office systems (IOS)
- Word processing
- Desktop publishing
- Electronic publishing
- Image systems
- IOSs—such as IBM's OfficeVision, HP's NewWave Office and DEC's All-In-1—typically include the following core functions, all of which are accessed from the same desktop: electronic mail, decision support systems, time management and filing systems.
- Office systems graphics include presentation graphics (which represent the bulk of office systems graphics), paint and line art, page description languages, and electronic form programs.
- The fundamental difference between electronic publishing and desktop publishing (within the office systems sector) is that electronic publishing encompasses a method of document management and control from a single point—regardless of how many authors/locations work on a document—whereas desktop publishing is a personal productivity tool and is generally a lower end product residing on a personal computer.
- Electronic or computer publishing systems that are sold strictly and specifically to commercial publishers, printers, and typesetters are excluded from cross-industry consideration and are included in the discrete manufacturing industry.

*Engineering and Scientific* encompasses the following applications:

- Computer-aided design and engineering (CAD and CAE)
- Structural analysis
- Statistics/mathematics/operations research
- Mapping/GIS
- Computer-aided manufacturing (CAM) or CAD that is integrated with CAM is excluded from the cross-industry sector as it is specific to the manufacturing industries. CAD or CAE that is dedicated to integrated circuit design is also excluded because it is specific to the semiconductor industry.



*Planning and Analysis* consists of software products and information services in four application areas:

- Executive Information Systems (EIS)
- Financial modeling or planning systems
- Spreadsheets
- Project management

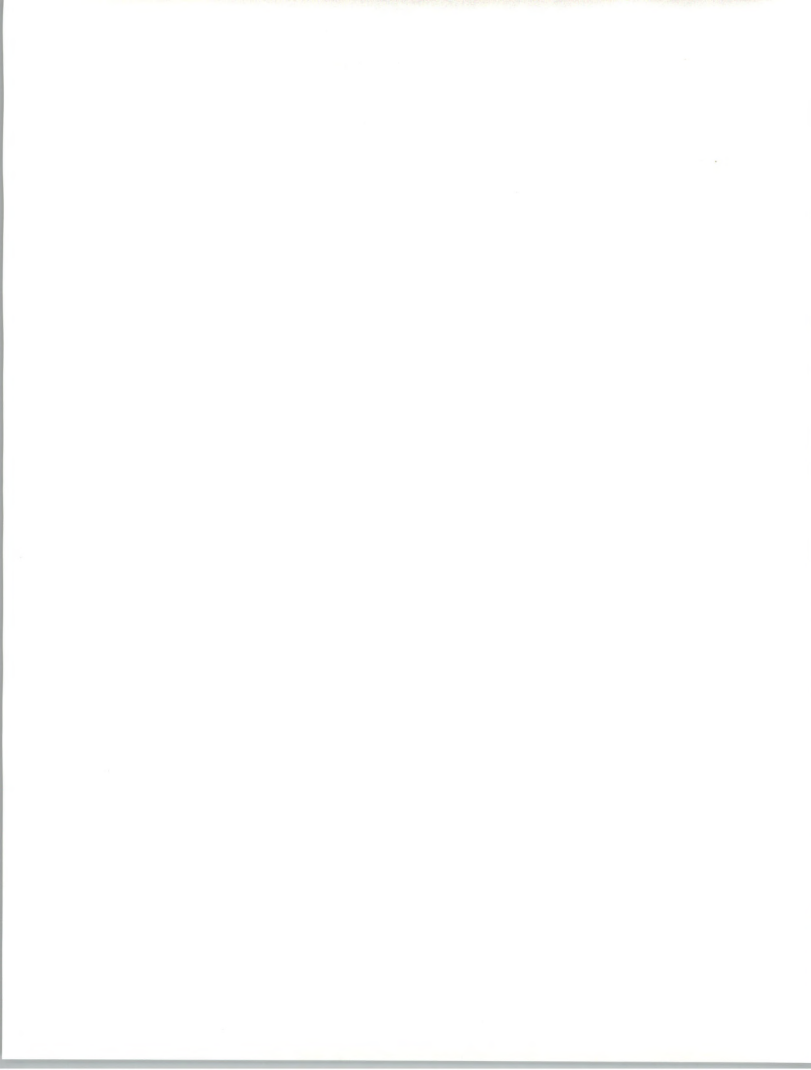
*Sales and Marketing* encompasses marketing management and sales analysis application solutions.

- Sales and marketing includes:
  - Sales analysis
  - Marketing management
  - Demographic market planning models

### 3. Delivery Mode Reporting by Sector

This section describes how the delivery mode forecasts relate to the market sector forecasts. Exhibit A-11 summarizes the relationships.

- *Processing services* - The transaction processing services submode is forecasted for each industry and cross-industry market sector. The utility and other processing services submodes are forecasted in total market in the general market sector.
- *Turnkey systems* - Turnkey systems is forecasted for the 15 industry and 7 cross-industry sectors. Each component of turnkey systems is forecasted in each sector.
- *Applications software products* - The applications software products delivery mode is forecasted for the 15 industry and 7 cross-industry sectors. In addition, each forecast is broken down by platform level: mainframe, minicomputer and workstation/PC.
- *Systems operations* - Each of the systems operations submodes is forecasted for each of the 15 industry sectors.
- *Systems integration* - Systems integration and each of the components of systems integration are forecasted for each of the 15 industry sectors.
- *Professional services* - Professional services and each of the submodes is forecasted for each of the 15 industry sectors.



## EXHIBIT A-11

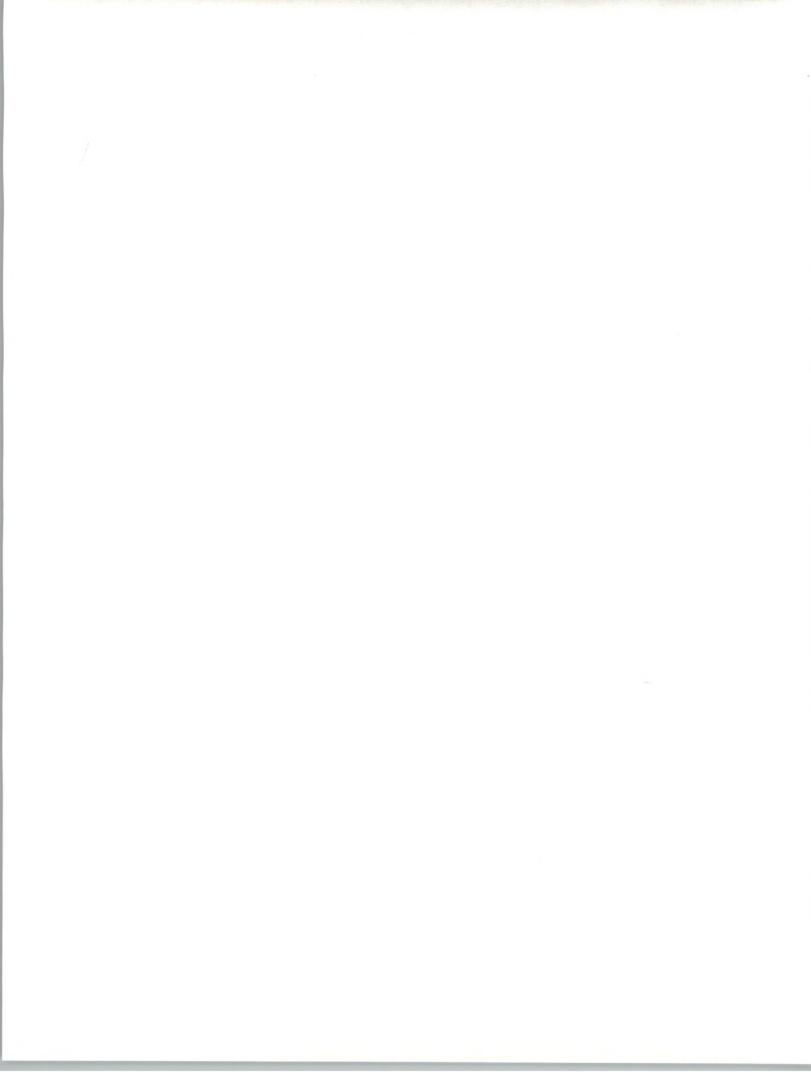
### Delivery Mode versus Market Sector Forecast Content

Delivery Mode	Submode	Market Sectors		
		Industry Sectors	Cross-Industry Sectors	General
Processing Services	Transaction Utility Other	X	X	X X
Turnkey Systems		X	X	
Applications Software Products		X	X	
Systems Operations	Platform Applications	X X		
Systems Integration		X		
Professional Services		X		
Network Services	Network Applications Electronic Information Services	X X		X
Systems Software Products				X
Equipment Services				X

- *Network services* - The network applications submode of network services forecasted for each of the 15 industry sectors.

Industry and cross-industry electronic information services are forecast in relevant market sectors. The remainder of electronic information services is forecasted in total for the general market sector.

- *Systems software products* - Systems software products and its submodes are forecasted in total for the general market sector. Each submode forecast is broken down by platform level: mainframe, mini-computer and workstation/PC.





- *Equipment services* - Equipment services and its submodes are forecasted in total in the general market sectors.

## F

### Vendor Revenue and User Expenditure Conversion

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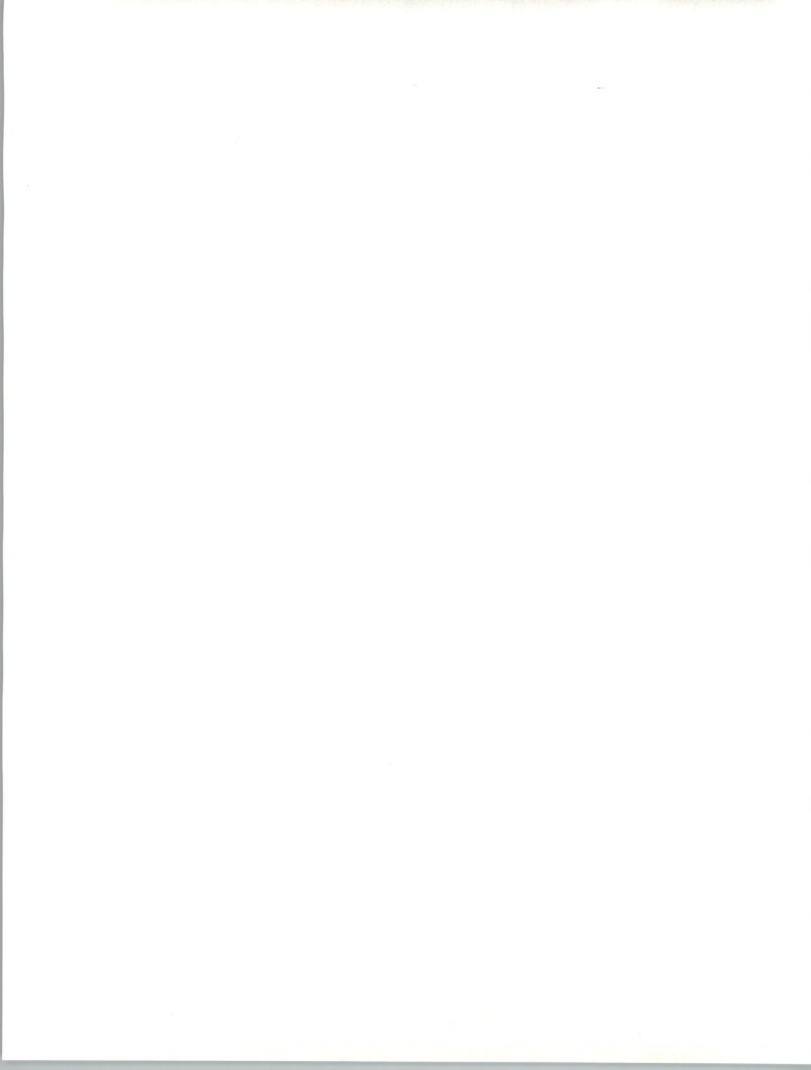
The size of the information services market may be viewed from two perspectives: vendor (producer) revenues and user expenditures. INPUT defines and forecasts the information services market in terms of user expenditures. User expenditures reflect the markup in producer sales when a product such as software is delivered through indirect distribution channels (such as original equipment manufacturers (OEMs), retailers and distributors). The focus on user expenditure also eliminates the double counting of revenues that would occur if sales were tabulated for both producer (e.g., Lotus) and distributor (e.g., ComputerLand).

For most delivery modes, vendor revenues and user expenditures are fairly close. However, there are some areas of significant difference. Many microcomputer software products, for example, are marketed through distribution channels. To capture the value added through these distribution channels, adjustment factors are used to convert estimated information services vendor revenues to user expenditures.

For some delivery modes, including software products, systems integration and turnkey systems, there is a significant volume of intra-industry sales. For example, systems integrators purchase software and subcontract the services of other professional services vendors. Turnkey vendors incorporate purchased software into the systems they sell to users.

To account for such intra-industry transactions, INPUT uses conversion ratios to derive the estimate of end-user expenditures.

Exhibit A-12 summarizes the net effect of the various ratios used by INPUT to convert vendor revenues to user expenditure (market size) figures for each delivery mode.



## EXHIBIT A-12

**Vendor Revenue to  
User Expenditure Conversion**

Delivery Mode	Vendor Revenue Multiplier
Applications Software Products	1.18
Systems Software Products	1.10
Systems Operations	0.95
Systems Integration	0.95
Professional Services	0.99
Network Services	0.99
Processing Services	0.99
Turnkey Systems	0.95
Equipment Services	0.99



## B

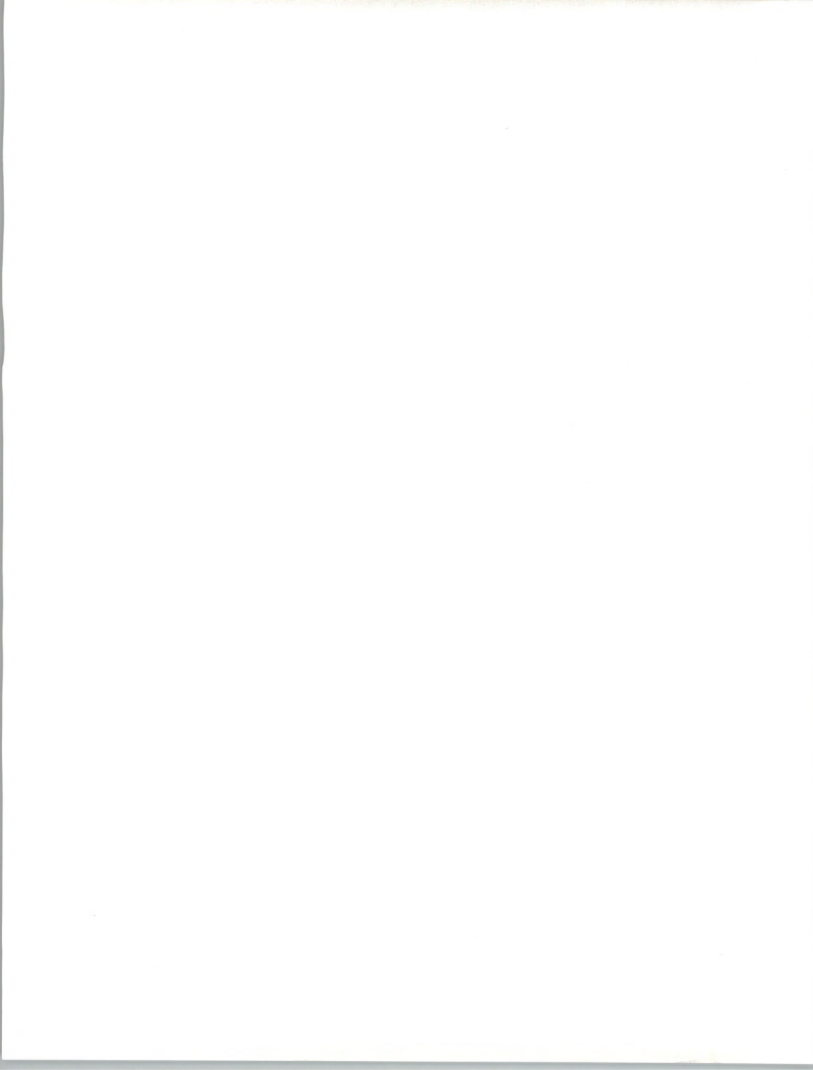
## Forecast Data Base

This year's forecast for payroll and human resources processing services has been lowered based on additional forecast data obtained from vendors that indicates a lower expenditure outlook for the next five years. None of the driving forces have changed.

## EXHIBIT B-1

**Human Resources Cross-Industry Sector  
User Expenditure Forecast by Delivery Mode, 1991-1997**

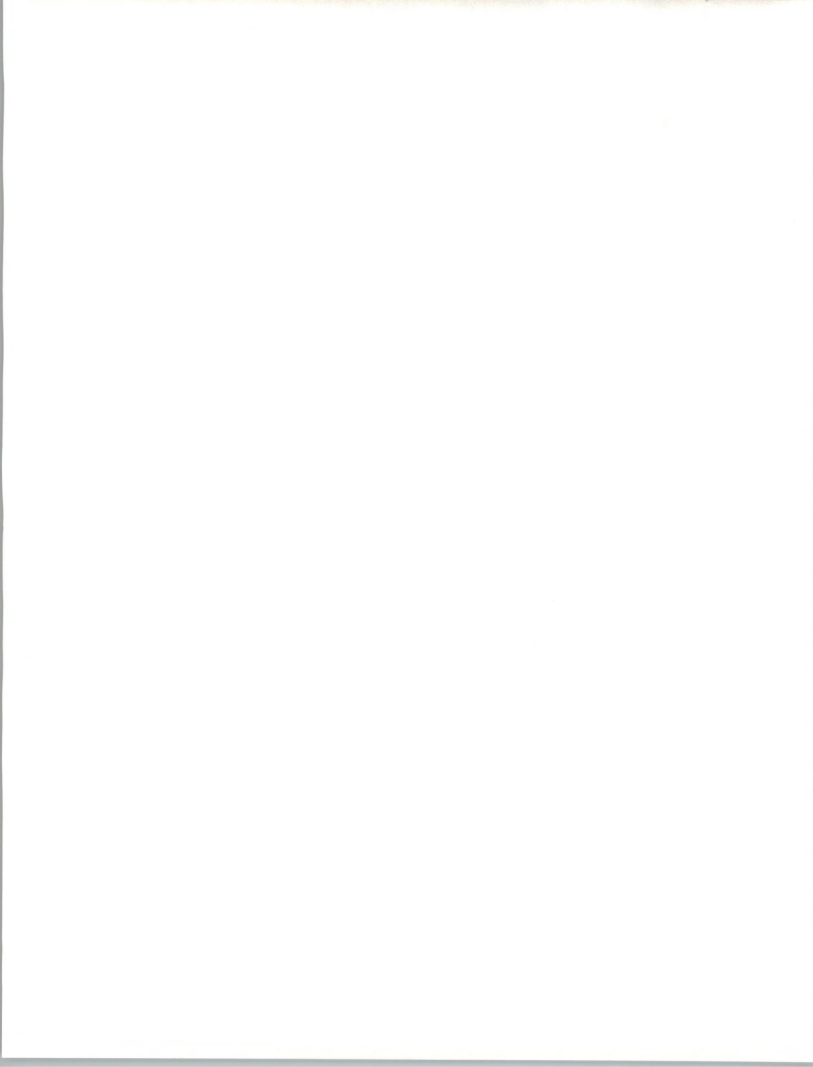
Delivery Modes	1991 (\$ M)	Growth 90-91 (%)	1992 (\$ M)	1993 (\$ M)	1994 (\$ M)	1995 (\$ M)	1996 (\$ M)	1997 (\$ M)	CAGR 92-97 (%)
<b>Sector Total</b>	2,454	6	2,610	2,790	2,980	3,190	3,445	3,745	7
<i>Processing Services</i>	1,676	5	1,760	1,850	1,940	2,040	2,140	2,250	5
- Transaction Processing	1,676	5	1,760	1,850	1,940	2,040	2,140	2,250	5
<i>Turnkey Systems</i>	84	10	85	90	90	90	90	95	2
<i>Applications Software Products</i>	694	1	765	850	950	1,060	1,215	1,400	13
- Mainframe	265	6	280	295	310	325	340	360	5
- Minicomputer	256	7	275	295	320	345	375	400	8
- Workstation/PC	173	21	210	260	320	390	500	640	25



## EXHIBIT B-2

### Human Resources Cross-Industry Sector 1992 MAP Data Base Reconciliation by Delivery Mode

Delivery Modes	1991 Market				1996 Market				91-96 CAGR per data 91 rpt (%)	91-96 CAGR per data 92 rpt (%)
	1991 Report (Fcst) (\$ M)	1992 Report (Actual) (\$ M)	Variance from 1991 Report		1991 Report (Fcst) (\$ M)	1992 Report (Fcst) (\$ M)	Variance from 1991 Report			
			(\$ M)	(% )			(\$ M)	(% )		
Sector Total	2,454	2,454	0	0	3,794	3,445	-349	-9	9	7
Processing Services	1,676	1,676	0	0	2,460	2,140	-320	-13	8	5
- Transaction Processing	1,676	1,676	0	0	2,460	2,140	-320	-13	8	5
Turnkey Systems	84	84	0	0	92	90	-2	-2	2	1
Applications Software Products	694	694	0	0	1,242	1,215	-27	-2	12	12
- Mainframe	265	265	0	0	338	340	2	1	5	5
- Minicomputer	256	256	0	0	376	375	-1	0	8	8
- Workstation/PC	173	173	0	0	528	500	-28	-5	25	24





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